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THE PATHOLOGIC PHYSIOLOGY OF UTERINE BLEEDING*

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The study of uterine bleeding is given a peculiar interest by the fact that the uterus is the only organ in the body from which a periodic hemorrhage occurs as a physiologic phenomenon. The logical point of departure in the investigation of pathologic uterine hemorrhage, therefore, would seem to be a study of the normal type of uterine bleeding, that is, menstruation. Even a superficial familiarity with the enormous literature of the subject, however, will convince one that the problem is rarely approached in this fundamental way. In the study of all the menstrual disorders the tendency has been to lose sight of the fact that there are many links in the menstrual chain, and to emphasize some one factor at the expense of others, which may be equally important. As regards the explanation of uterine bleeding, it is the anatomic point of view which has in recent years received most attention. This is perhaps not surprising when we consider that up to very recent times our knowledge of the menstrual process has been much more highly developed along anatomic than along physiologic lines, and that structural alterations in an organ are far easier to demonstrate than aberrations of function. More and more, however, we are beginning to realize that the uterus is only a keyboard on which many variations are played by a complicated menstrual mechanism whose ramifications extend far beyond the confines of the pelvic cavity. Not only the uterus, but all the other constituent parts of the menstrual apparatus as well are subject to disturbances of one form or another, and hence none of them should be overlooked in the investigation of uterine hemorrhage of obscure causation.

At the outset it may be conceded that in the majority of instances the cause of uterine bleeding is anatomic, in some cases very frankly so. For example, uterine cancer is a perfectly obvious cause of bleeding from the uterus, just as rectal cancer may cause bleeding from the bowel. The same clear relationship is seen in the case of a few other lesions, more especially those of neoplastic type. We may thus distinguish, first of all, a type of uterine hemorrhage clearly due to well-defined and easily demonstrable causes in one part or another of the uterus. There would be hemorrhage from lesions of this type even though there were no such thing as menstruation to cause a periodic flare-up in the pelvis.

A second group of cases may be distinguished in which a lesion of some sort exists either in the uterus or in the adnexa, but in which hemorrhage would probably not occur were it not for the extra congestion which each menstruation brings with it. A tubal inflammatory mass or an ovarian neoplasm might not in itself be capable of producing hemorrhage, but it frequently exaggerates the menstrual hyperemia, and hemorrhage is the result. When metrorrhagia or intermenstrual bleeding occurs, it would seem at first sight to indicate a direct effect of the lesion itself on the pelvic circulation. This, however, does not necessarily follow, for it is possible, as some have contended, that in many of these cases the disturbance of the menstrual mechanism is much more fundamental, involving the function of the ovary itself.

Finally, there is a third group of cases in which uterine hemorrhage occurs in the entire absence of any clearly demonstrable disease in any of the pelvic organs. I use the expression "clearly demonstrable" advisedly, for numerous efforts have been made to explain the bleeding in these cases along anatomic lines. For many years it was the endometrium which constituted the target for the diagnostic acumen of gynecologic pathologists. The work of Hitschmann and Adler,[1] confirmed by many others,[2] has done much to clarify our knowledge of the part played by the endometrium in the menstrual process. Except in certain rather exaggerated conditions, such as polypoid endometritis, it is difficult to fix on the endometrium any great measure of responsibility as a cause of uterine bleeding. Many of the supposed abnormalities of the endometrium are perhaps the results rather than the causes of the menstrual disturbances, for we are apt to forget that the hypertrophic changes of the premenstrual period represent the reaction to periodic hyperemia of a very labile tissue — and a tissue made more labile by constant repetition of the process over many years, or, from an evolutionary point of view, over many ages. Abnormalities of the menstrual phenomenon, either in rhythm or in intensity, may thus be reflected in the endometrium, which plays a purely passive part in the process. Furthermore, since the endometrium is always "on edge," it may undergo hypertrophic changes as a reaction to hyperemia other than that associated with menstruation.

In view of our inability to fix the responsibility for uterine bleeding entirely on the endometrium, it is not surprising that the search for a local cause has gone

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1. Hitschmann and Adler: Monatsch. f. Geburtsh. u. Gynäk., 1908, xxvii, 1.
2. Gardner, W. S., and Novak, Emil: The Endometrium and Some of Its Variations, THE JOURNAL A. M. A., Oct. 9, 1909, p. 1155.

deeper into the uterus. It was Scanzoni, in 1861, who first directed attention to the importance of the mesometrium in this connection. Although receiving little attention for many years, the subject has in recent years been again brought to the forefront by the work of Theilhaber[3] and others. It is not within my province to discuss the various theories which have been put forth—the "insufficientia uteri" of Theilhaber, the "metrorrhagia myopathica" of Anspach, etc. There can be little doubt that the myometrium, like the endometrium, is responsible for a certain number of cases of uterine hemorrhage, but the proportion is probably not so large as to throw any great light on the mechanism of uterine hemorrhage in general.

Even less important, to my mind, is the rôle played by disease of the blood-vessels in the production of bleeding from the uterus. Much importance is attributed to this factor by Pankow,[4] Slocum[5] and others. There are many objections to such a view, especially to the explanation which many offer that the bleeding is the result of an actual rupture of the blood-vessels — an "apoplexia uteri." This is not the place to discuss these objections — some will suggest themselves. No satisfactory proof has been advanced that arteriosclerosis or atheroma of the pelvic blood-vessels exerts more than an occasional influence in producing uterine hemorrhage.

It will thus be seen that the occurrence of uterine bleeding is not necessarily associated with anatomic findings in the uterus, which is the immediate source of the menstrual flow, or in the other pelvic organs which participate to a greater or less extent in the menstrual phenomenon. Shall we, in spite of our failure to find an anatomic explanation in many cases of uterine bleeding, still tell ourselves that it *must* be there? Or shall we make our study more comprehensive, remembering that other factors than the organs themselves are concerned in menstruation, and that abnormal uterine bleeding may perhaps be due to aberrations of these other cogs in the menstrual mechanism?

What are these other links in the menstrual chain? What, first of all, is the fundamental cause of menstruation? We have for many years looked on the ovary as primarily responsible for the occurrence of menstruation. Certainly the complete removal of all ovarian tissue as a rule — some say always — causes cessation of menstruation. There is abundant proof that this function of the ovary is dependent on an internal secretion which it contributes to the blood-stream. On the other hand, many facts are known which indicate how intimately the ovarian hormone is bound up with that of many other glands in the body which produce internal secretions. There are some indeed, who maintain that, important as the ovary is to menstruation, the ovarian hormone is not the ultimate cause of the latter. According to this theory, which is suggested by so good an observer as Halban, the ovary is merely the activator of the real underlying cause, which resides in some other part of the body, most likely in some of the ductless glands. It is no longer a mere theory that the ductless glands form a functional chain throughout the body, and that disturbances of any one of them are apt to exert a far-reaching effect on other members of the group. However indispensable the function of the ovary in menstruation, an important contributory rôle must be assigned to these other organs of internal secretion. There is much evidence of a functional relationship between the ovary and the thyroid, the ovary and the hypophysis, and the ovary and the suprarenals. As regards the other ductless glands, the evidence is not quite so imposing, though many scattered facts point to more or less correlation of function in the case of almost all of them. I shall not here discuss the still disputed question as to which element or elements of the ovary produce the hormone which exerts such a profound influence on menstruation.

How does the ovarian hormone bring about the hyperemia of menstruation? Either it acts directly on the blood-vessel walls or else it produces its effect through the vasomotor nerves. There is some reason for supporting the first of these views, although the second manner of action is more commonly found in the body. Physiologists, I believe, are prone to speak of any relay station in the spinal cord or elswhere as a "center," and from this point of view some have spoken of a so-called menstrual center, usually described as being located in the lumbar portion of the spinal cord. While there seems to be no definite knowledge concerning such a center, there is no question that the vasomotor nerves of the pelvis play an important rôle — whether essential or only supplementary we cannot say — in the production of the hyperemia which is perhaps the most conspicuous feature of menstruation. The vasomotor nerves are offshoots of the sympathetic nervous system, and through the rami communicantes are linked up with the cerebrospinal system and even with the psychic centers in the brain. The significance of these facts I shall elaborate later in my paper.

From this brief summary it may be seen that the factors concerned in menstruation are (1) an underlying cause; (2) a nervous mechanism, essentially vasomotor in nature, and (3) the uterus, and especially the endometrium. The cardinal theme of my paper is that uterine bleeding may be due to disturbance or perversion of any of these factors, and that an intelligent study of a given case must embrace a search, not for anatomic alterations alone, but for deviations from the normal physiology as well. In accordance with the foregoing views of normal menstruation, I suggest that the causes of uterine bleeding may be divided into three groups: (1) the fundamental causes, embracing disturbances of the internal secretions, either of the ovary or of some of the other *Blutdrüsen;* (2) the nervous causes, which exert their effect mainly through the agency of the vasomotor nerves, and (3) the anatomic causes, which have to do with structural alterations in the pelvic organs, pelvic blood-vessels or, for that matter, in the blood itself.

A discussion of the last group is scarcely within the province of my paper. I can only repeat that the cause of uterine bleeding is most frequently to be found in this group, which embraces such common conditions as uterine and ovarian neoplasms, adnexal inflammations, incomplete miscarriage, etc. My discussion will therefore be limited to the fundamental and nervous causes of uterine hemorrhage, both of which are admittedly less frequently observed than the anatomic group.

3. Theilhaber: Arch f. Gynäk., 1902, lxvi, 1.
4. Pankow: Arch. f. Gynäk., 1906, lxxx, No. 2.
5. Slocum: Surg., Gynec. and Obst., April, 1908.

In the consideration of the fundamental causes of uterine bleeding, we at once find ourselves on very uncertain ground. In the enormous literature concerning the internal secretions, there is much less of fact than of fancy. When the ductless gland faddist, if you choose to call him so, blows his warm breath on the molecule of fact, it is quite apt to be vaporized into the mountain of hypothesis and speculation. And yet from this great nebula of hypothesis new facts are constantly being crystallized.

As already stated, it is with the ovary that we are primarily concerned in the consideration of menstruation and its various disturbances. The study of the ovarian hormone, like that of the other internal secretions, is much easier along negative than along positive lines. To illustrate, by mere extirpation of the ovaries we may show that cessation of menstruation is due to loss of the ovarian hormone. But it is far more difficult to bring about a condition of hyperfunction of the ovaries, nor is it even certain that such a condition of "hyperoophorism," analogous to hyperthyroidism, may be produced. In the case of the thyroid, mere feeding of the gland extract to a normal person suffices to bring about hyperthyroidism. On the other hand, the possibility of producing hyperoophorism by feeding ovarian extract has been questioned. This is perhaps not surprising when we consider how little we know concerning the nature and characteristics of the ovarian hormone or hormones, and how gradual and inconspicuous would probably be the effect of an excess of ovarian secretion, even though we were sure that this could be produced by mere feeding of the extract. A number of cases have been recorded in which hyperoophorism has apparently been brought about by the latter method. A rather striking case in the recent literature is that of Adler.[6] It was that of a girl of 21, who had menstruated normally since the age of 15, but who after a short course of an ovarian extract for the first time in her life menstruated four days before the expected time, the flow being much more profuse and lasting longer. After the cessation of the treatment menstruation resumed its old periodicity, duration and intensity.

Much more interesting, however, is the effort of Adler to determine the existence of hyperoophorism in an indirect manner. His method requires a word of explanation. As with the other viscera, the principal nerve-supply of the uterus is derived from the sympathetic. A very revolutionary change is now in progress as regards our ideas of the physiology of the sympathetic nervous system, or, as it is frequently called, the vegetative system. According to the classical description of Langley, the entire vegetative system may be divided into two portions. First, there is the gangliated cord which stretches along each side of the midline of the body, and which may be called the sympathetic system proper. Secondly, many of the autonomic functions of the body are in part regulated by certain cerebrospinal nerves derived principally from the brain and from the sacral portion of the spinal cord. These nerves constitute what is therefore called the craniosacral autonomic system. From the fact that the vagus nerve is the most prominent constituent, this system is also spoken of as the vagal. Kraus, again, speaks of it as the parasympathetic. The distinction between the two systems can perhaps be best illustrated by the case of the heart. This organ receives its accelerator supply from the sympathetic, its inhibitory supply from the vagus. The former is the whip of the heart, the latter the brake. This antagonism in function is characteristic, being noted in all the other organs, including the uterus. To proceed to the practical application of these facts, it has been found that certain drugs show an elective affinity for one or the other of the two systems. Epinephrin, in accordance with the well-known law of Langley,[7] affects especially the sympathetic, its injection causing precisely the same effect on an organ as does stimulation of its sympathetic nerve-supply. It is therefore spoken of as a sympathicotropic drug. On the other hand, pilocarpin is perhaps the best-known of a group of drugs which exert a special action on the vagal system, and which are therefore spoken of as vagotropic drugs. To carry the point still farther, it has been found that certain endogenous chemical substances of the body, more particularly the various hormones, exhibit a special influence on one or the other of these two systems. There is reason

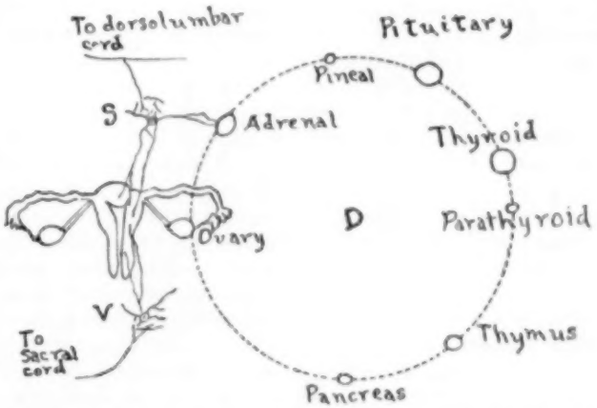

Diagram showing principal physiologic factors concerned in menstruation. *D*, the ductless gland chain, the ovary being the organ most intimately related to menstruation. *S* and *V*, the two physiologic divisions of the vegetative nerve system—the sympathetic proper and the craniosacral autonomic, respectively. Both are traceable to the cerebrospinal system, and the sympathetic is seen to be directly connected with the ductless gland chain, notably at *x*, with the adrenal.

to believe that before very long all the various hormones of the body will be divisible into two groups, one sympathicotropic, the other vagotropic. Much has already been done along this line.

Studies on the ovarian hormone from this point of view are still very meager. The observations of Adler,[6] however, are worthy of mention. After removal of the ovaries, and to a less extent in cases of ovarian insufficiency manifesting themselves by amenorrhea and genital hypoplasia, he finds that there is an increased susceptibility to small doses of the sympathicotropic epinephrin. On the contrary, in the study of a series of cases of uterine bleeding, he observed no reaction whatsoever to epinephrin, while on the other hand there was a marked susceptibility to even very small doses of the vagotropic pilocarpin. This result he regards as justifying the view that these cases of uterine bleeding were due to overfunction of the ovary.

This conclusion, however, is open to serious question, when we consider that many structures other than the ovary contribute to the characteristic reac-

6. Adler: Arch. f. Gynäk., 1912, xcv, 349.

7. Langley: Schaefer's Text-Book of Physiology, ii.

tions. Even so, however, such work as this is of exceeding value. For perhaps the first time, we are now able to attack the hitherto rather intangible problem of the internal secretions by simple clinical methods instead of by complicated laboratory investigation. Just what practical results will accrue from this new line of endeavor remains to be seen. In the light — or shall I say the darkness? — of our present knowledge of the influence of various hormones on menstruation, the present methods of organotherapy in gynecologic disorders are largely empiric. Until we can put our figurative finger on the specific hormone or hormones at fault, there is little hope of a rational therapy of the various menstrual disorders which are now so indiscriminately treated by various organic extracts. Even before the realization of such an ideal, however, we may hope for advance through studies based on the demonstrated relation between the vegetative nerves and the internal secretions of the body, including that of the ovary. If we cannot definitely determine that uterine bleeding in a given case is due to disturbance of some specific hormone, would it not be a real advance, for example, to be able to say that it is characteristically associated with a condition of vagotony? Even therapeutic possibilities suggest themselves from work along this line.

Though as yet on a small scale, I have entered on the study of this fascinating subject, and as far as uterine bleeding is concerned, have had results in part at least similar to those of Adler. The most marked vagotonic reactions which I have noted have been in four cases of hemorrhage in girls at puberty. In all these cases, the injection of from 1/15 to 1/10 grain of the vagotonic pilocarpin gave a most pronounced reaction, characterized especially by profuse perspiration, a feeling of warmth, salivation, contraction of the pupils, etc. On the other hand, the strongest epinephrin reactions have been noted in women at the menopause. The injection of 1 mg. of epinephrin (about 15 minims of the 1 : 1,000 solution) caused pronounced tremor, nervousness, a feeling of cold or chilliness, dilatation of the pupils, rapid heart-beat, and rise of blood-pressure. It must not be supposed, however, that such methods will enable us to work out the problem of uterine bleeding by rule of thumb. Many apparent contradictions have occurred in my own work, some of them difficult or impossible of explanation. For details as to the theory and general method of such study, I would refer those interested to the articles of Adler,[6] Eppinger and Hess,[8] and Barker and Sladen.[9] My own results I hope to record in detail in a later paper.

Another physiologic factor in the causation of uterine hemorrhage which is closely associated with the activity of the glands of internal secretion has reference to the presence of some local factor in the endometrium which is capable of diminishing the coagulability of the blood and thus predisposing to bleeding. Sturmdorf[10] has suggested that the endometrium, under the influence of the ovarian hormone, manufactures a substance which inhibits the normal coagulability of the blood. The experimental work of Schickele[11] and others has led to somewhat similar conclusions. Schickele's results are based on the study of the inhibiting influence of extracts and expressed juices of the uterus and ovaries on the coagulability of the blood. When there was abnormal bleeding from the uterus, he found that the inhibitory powers of the ovarian extracts are greater than those of the uterus; but when profuse menstrual bleeding was present, it was found that the extracts from the uterus exerted a much greater inhibiting effect on coagulation. This would seem to indicate that bleeding is associated with the accumulation of coagulation-inhibiting substances in the endometrium. Without going into greater detail, I need only say that the work of Schickele indicates that the inhibiting substances are formed in the ovaries and given off in the uterus. When uterine bleeding is present, there is an excessive amount of these inhibiting substances in the uterus. Schickele suggests that this is probably due to overactivity of the ovary, so that ultimately this local physiologic factor in the causation of the bleeding is apparently traceable to a fundamental disturbance in the mechanism of the menstrual process. The occasional success of the operation of curettage in the relief of uterine hemorrhage, even when the endometrium is anatomically normal, may perhaps be explained on the basis of this work, the good result being due to the removal of the inhibiting substance rather than of the endometrium.

As to the dependence of uterine bleeding on disturbance of other internal secretions than that of the ovary, I can only mention the possibilities, accurate observations still being very meager. That a functional relationship exists between the generative organs and the thyroid gland is now a well-established fact. The swelling of the thyroid at menstruation and during pregnancy, and the occasional occurrence of even acute hyperthyroidism after removal of the ovaries, are manifestations of this physiologic correlation. While observations are not unanimous on this point, it seems to be true that hyperthyroidism frequently includes among its other symptoms menorrhagia or metrorrhagia, while hypothyroidism, on the other hand, is more commonly associated with the occurrence of amenorrhea or scanty menstruation. These conclusions are based on the study of outspoken cases of deficient or excessive thyroid secretion, as the case may be. When one considers the frequency of minor grades of thyroid disturbance, and how often they are overlooked, it is easy to appreciate that a certain proportion of cases of uterine bleeding may be thyroid in origin.

Concerning the possible influence of other ductless glands, we can say even less of a definite nature. That the pituitary exerts an influence on menstruation is illustrated in the well-recognized adiposogenital dystrophy of Frölich, due to pituitary deficiency and characterized clinically, among other symptoms, by amenorrhea or scanty menstruation. This being true, one is tempted to believe that the opposite condition, menorrhagia, is perhaps sometimes due to hyperpituitarism. Of this, however, there is no direct proof, and as a matter of fact, many cases of hyperpituitarism appear to be associated with amenorrhea. Here again we encounter the possibility that there is more than one hormone concerned, or that the bleeding is due to a perversion of the secretion — a dyspituitarism — rather than to a simple excess or deficiency. In the case of the adrenals, the work of Bulloch and Sequeira, and many others leaves no reason to doubt

8. Eppinger and Hess: Die Vagotonie, Samml. klin. Abhandl. über Path. u. Therap. des Stoffwechsels, Berlin, 1910.
9. Barker and Sladen: Tr. Assn. Am. Phys., 1912, xxvii, 471.
10. Sturmdorf: New York State Jour. Med., 1911, xi, 460.
11. Schickele: Arch. f. Gynäk., 1912, xcvii, 409.

that these bodies are closely correlated with the generative organs, although there is no evidence as yet that they may be causative factors in uterine bleeding.

We come, finally, to a consideration of the nervous causes of hemorrhage from the uterus. A few years ago it would have been considered only a fanciful hypothesis to attribute to the nervous system a part in the causation of uterine bleeding. When we consider, however, that such a condition as exophthalmic goiter appears often to follow severe nervous shock, and that Crile has demonstrated that the emotion of fright produces definite structural alterations in the brain-cells, we must certainly have greater respect for the nervous system as a disturber, not only of function, but also of structure. There are many functions of the body which are essentially autonomic, but in which a vestige of voluntary control is still evident. In defecation and micturition the control of the will is still an important factor. In the case of such a function as digestion, the voluntary factor is far less important, while in the case of menstruation, to go still farther, the influence of the volitional factor is unrecognizable under normal conditions. And yet even with menstruation the higher centers still retain at least a vestigial degree of control, and under pathologic conditions, this may be greatly exaggerated.

The nervous factor in uterine bleeding has already in a measure been touched on in the discussion of the vegetative nerves as they influence the internal secretion of the ovary. It is scarcely necessary to add that what is true of their influence on the ovarian secretion is equally true as regards their influence on the other internal secretory tissues. No one can as yet say to what extent the influence of these various internal secretions on menstruation is directly chemical, and to what extent it is exerted through the medium of the vasomotor nerves. Like the vasomotor nerves in all other parts of the body, those supplying the generative organs arise ultimately from the cerebrospinal axis, the primary vasomotor center being definitely located in the floor of the fourth ventricle. The center is linked up with the psychic center, thus explaining the occasional occurrence of uterine bleeding as a result of severe emotional disturbance of one form or another. A number of such cases have come under my own observation, of which the following two are typical:

A woman of 42, a multipara, had always menstruated regularly, the flow lasting usually about four days. A menstrual period commenced, Dec. 23, 1913. December 26, as the flow was abating, a Christmas tree in her home took fire, setting the room ablaze. The woman received a severe fright, and within a short while, a profuse hemorrhage set in, lasting for six or eight hours, and then gradually abating.

A girl of 15, who had commenced to menstruate at 13, was brought to the dispensary with profuse uterine bleeding. Her menstruation had never been regular, amenorrhea being frequently noted. There had never previously been any excessive flow. The history given was that an assault on the child had been attempted on the preceding day. On account of the bleeding, it was thought that there might have been some local injury. Examination disproved this, the assault having evidently been unsuccessful. Regular menstruation, lasting three days, had occurred five weeks previously. The hemorrhage in this case was apparently due to the nervous shock associated with the attempted assault.

A number of other cases of this type might be cited. Similar cases are reported by Ehrenfest[12] and others. That hemorrhage may be of neurotic origin has been abundantly shown by Brown-Séquard, von Recklinghausen and others. There is nothing very revolutionary in such an explanation, for many other phenomena might be mentioned which illustrate the influence of the psyche on processes which in themselves are essentially autonomic — the "watering" of the mouth at the sight or smell of food, the acceleration of the heart from fright or joy, the sweating so characteristic of intense anxiety, etc. Even more apropos, since they illustrate the influence of psychic disturbances on the vasomotor apparatus, are such phenomena as the blush of shame or embarrassment, or the bleeding from the stomach or even from the skin which has been observed in highly nervous or hysteric women. From a theoretic point of view as well as from clinical experience, we may therefore conclude that certain cases of uterine bleeding are undoubtedly neurotic in origin, or, more properly, perhaps, "angioneurotic."

The close interlocking of the nervous system and the ductless glands makes it possible that severe psychic disturbances produce menstrual aberrations by a direct effect on the functions of the internal secretory glands. Such a phenomenon would be analogous to the glycosuria which has been shown to occur at times in conditions of severe fright and other emotional disturbance, and which is explained as being due to a nervous excitation of the adrenal bodies. This has been corroborated by the failure of the glycosuria to appear if the nerves supplying the adrenals have previously been cut, thus severing the connection of the latter with the psychic centers. I mention this to emphasize the fact that a direct connection between the psychic centers and the ductless gland chain has been demonstrated experimentally. The nervous factor in uterine hemorrhage, like that of the internal secretions, is most apt to make itself manifest at those periods when the woman's menstrual equilibrium is already unstable, that is, puberty and menopause.

SUMMARY

1. The proper basis for the study of uterine bleeding is the study of normal menstruation, along physiologic as well as anatomic lines.

2. The factors concerned in normal menstruation are (*a*) an ultimate cause, residing in the ductless gland chain; (*b*) a nervous mechanism, essentially vasomotor in character; (*c*) the pelvic organs, and especially the uterus.

3. The causes of uterine bleeding may therefore be grouped as (*a*) fundamental, involving disturbances of the internal secretions; (*b*) nervous, exerting their effect mainly through the vasomotor nerves; (*c*) anatomic, in which structural changes are present in the uterus or other pelvic organs.

4. Most frequently the exciting cause of uterine hemorrhage is anatomic, the lesion being in the uterus, tubes, ovaries, blood-vessels or even the blood itself.

5. In a not inconsiderable number of instances, bleeding is due to fundamental or nervous causes, especially at the two extremes of menstrual life, puberty and the menopause.

6. There is good reason to believe that much light will be thrown on the rôle of the fundamental causes, and perhaps even of the nervous causes, by clinical methods of study which are based on the relation known to exist between the ductless gland apparatus and the vegetative nerve system.

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12. Ehrenfest: Amer. Jour. Obst., February, 1908.

RADIUM IN THE TREATMENT OF UTERINE HEMORRHAGE AND FIBROID TUMORS *

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The association of several diverse pathologic conditions may occasion surprise. Our excuse for presenting them together in this instance is that they have certain characteristics in common, namely, they are all benign, all chiefly troublesome on account of hemorrhage, and all remarkably united in their ready response to ray-therapy.

Until recently the control of uterine hemorrhage and the relief of symptoms of pressure occasioned by fibroid tumors have been possible with certainty only by radical surgical procedures.

The benign conditions which we wish to consider in this paper fall readily into four groups, excluding uterine hemorrhages due to cancer and other malignant disease, as well as those due to inflammatory disease of the adnexa, and those due to pregnancy and miscarriage.

The first group includes cases in adult women in which there is marked menorrhagia or metrorrhagia with no disease of the pelvic organs, except perhaps a slight enlargement of the body of the uterus. The endometrium taken from such uteri is microscopically normal. These cases belong to the so-called myopathia hemorrhagica class.

The second group takes in most of the hemorrhages which occur in young girls. In many of these the local findings are exactly as in Group 1. In some instances the condition is similar to that found in Group 3 (polypoid endometrium). Although pathologically this group cannot be separated from the others, it presents marked and distinctive features clinically, and in especial it differs radically in the indications for treatment. It is most important with these patients to avoid both sterility and mutilation.

The third group includes patients suffering with uterine hemorrhages who show no pathologic condition except an extensive polypoid overgrowth of the endometrium, which is generally termed polypoid endometritis.

The fourth group includes true uterine myomas, whether they are causing hemorrhage or merely giving discomfort through pressure on adjacent organs. Here the true aim of treatment is not only to regulate or stop the bleeding, but also to bring about the complete disappearance of the tumor.

MODE OF ACTION OF ROENTGEN AND RADIUM RAYS ON UTERINE HEMORRHAGIC CONDITIONS, ESPECIALLY FIBROID TUMORS

It has been firmly established both from animal experimentation and clinical observations on human beings that the Roentgen ray and the penetrating rays from radium are capable of destroying the primordial follicles of the ovary and the spermatogenic cells of the testicle. We have but to mention the names of Albers-Schoenberg, Brown, Osgood, Halberstaetter, Fraenkel, Faber, and many others who have contributed to our accurate knowledge in this direction. As it is the primordial follicles which give rise to the corpora lutea and determine menstruation, these results suggested at once that the penetrating rays might offer a means of causing amenorrhea and sterility. From the older literature it was known that many fibroids ceased to bleed and grew smaller after a double oophorectomy. A case of complete disappearance of a large fibroid tumor after this operation occurred in the service of one of us (H. A. Kelly) at the Johns Hopkins Hospital and is reported.[10] Reasoning on the basis of similar experiences, it was felt that the ray therapy had its primary effect on the ovaries and secondarily controlled the pathologic conditions in the uterus. Most of the technics devised for radiation based on this idea have particularly endeavored to concentrate a maximum amount of rays on the ovaries, leaving the tumor more or less out of consideration.

It has been well established both from Roentgen-ray and radium radiation that an obliterative endo-arteritis occurs almost invariably in the field radiated. We have noticed this condition in a marked degree in a number of cases in which we have operated after extensive radiation with radium. The natural conclusion therefore is that the effect on a fibroid tumor is due to the anemia following the occlusion of its nutrient vessels.

Against the conception that the influence on fibroids is mainly indirectly through the ovaries are the facts that many fibroids grow after the menopause, that some grow after the removal of the ovaries, and that marked regressions occur in tumors treated by the ray method in patients past the menopause. For these reasons we believe that there is a *specific and direct action of the rays on the tumor itself*, and we further believe that this happy result can be secured *quite independently of any action on the ovaries*. In the series of fibroids to be recorded in two cases the tumor disappeared without cessation of menstruation! In another already past the menopause there has been marked regression from a single treatment!

TECHNIC

In the tables we give with each case the amount of radium and the duration of the application. The reader will observe at once a wide variation in the individual cases. While we feel that the results given can all be duplicated by the same technics, we do not consider the matter of dosages in any sense settled. Our plan has been steadily to increase the milligrammage while decreasing the time. This is not only for economy and comfort to the patient but because of the better results and fewer complications occurring. The ideal method, where it is not desired to secure amenorrhea, is to limit the radiation so far as possible to the tumor itself, avoiding touching the ovaries. This is best secured by intra-uterine applications. It is sometimes well to reinforce such treatments by abdominal radiation either with radium or the Roentgen ray.

The technic advised is filtration through glass 0.5 mm. of platinum, 0.5 mm. of zinc foil, and 0.3 mm. of rubber. Such an apparatus, suitable shaped, is carefully introduced directly into the uterine cavity. Cervical applications alone we find to be less reliable, demanding much more radiation to secure results. As a preliminary to the introduction of the radium, the patient is given nitrous oxide and then thoroughly curetted, and examined carefully under complete anes-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Section and in the author's reprints.

10. Kelly and Cullen: Myomata of the Uterus, 1909, p. 505.

TABLE 1.—FIRST GROUP BLEEDING UTERI "MYOPATHICA HEMORRHAGICA"

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
289	Case 1 Miss L. H.	44	9/ 3/13	6 months	Marked bleeding; anemic	Medicinal. No benefit.	Normal organs	100 mg. 24 hrs.	Nauseated 3 days; no fever; abdom. tenderness 2 weeks.	None	Slight menstrual period October 3. None since. General health splendid. Slight menopausal symptoms.
291	Case 2 Mrs. R. S.	38	9/11/13	2 years	Rather severe; markedly anemic.	Medicinal only. No benefit.	Normal organs	80 mg. 24 hrs.	24 hrs. nausea; abdom. discomfort 3 weeks. some discharge; leukorrheal.	None	Slight period October, 1913. None since. Splendid health. No menopausal symptoms.
335	Case 3 Miss S. McL.	27	10/22/13	2 years	Very severe; anemic.	Local applications iodin, repeated curettages without result.	Normal organs	100 mg. 9 hrs., 10/23; 60 mg. Ra. 18 hrs., 12/1/13.	Menstruation November and December; slight nausea for 24 hrs.	None since	Complete amenorrhea. No menopausal symptoms; general health splendid.
383	Case 4 Mrs. F. M.	42	11/14/13	1 year	Very severe; anemic.	Medicinal. No benefit.	Slight enlargement of uterus.	60 mg. 10½ hrs.	None	None	Slight bleeding in December. None since. Slight menopausal symptoms.
385	Case 5 Mrs. J. D.	41	11/18/13	4 years	Very severe; marked anemia.	Local applications; general medication; curettement.	Uterus size of 6 weeks' pregnancy.	70 mg. 12 hrs.	Nauseated 1 day; headaches; some abdominal pain 2 weeks.	None	Menstrual period in December. None since. General condition excellent. Uterus reduced to normal size. Marked menopausal symptoms.
348	Case 6 Mrs. J. H. H.	45	12/18/13	1 year	Excessive; anemic.	Medicinal. No benefit.	Normal organs	100 mg. 6 hrs.	No discomforts	None	In January normal period. Since then no bleeding. No menopausal symptoms. Splendid health.
272	Case 7 Mrs. A. B.	28	7/21/13	Several years	Marked upset; marked anemia; general weakness.	Curettements, local applications, general medications; no benefit.	Normal organs	60 mg. 24 hrs.	Nauseated 2 or 3 days; uterine discharge 2 weeks; slight abdominal discomforts 2 weeks.	None	No further menstrual periods. Slight menopausal symptoms. Splendid general health.
786	Case 8 Mrs. C. R. C.	39	4/18/14	4 months	Severe; anemic.	Curettement; medicinal; no benefit.	Normal organs	268 mg. 2 hrs.	None	None	No further menstrual periods to date. Apparently cured. No menopausal symptoms.

TABLE 2.—SECOND GROUP: BLEEDING UTERI IN YOUNG GIRLS

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
176	Case 1 Miss F. P.	13	7/ 5/13	1 year with onset of periods.	Irregular, prolonged, severe.	Medicinal	Normal organs; normal endometrium.	20 mg. 5 hrs.	None	None	Normal periods since treatment.
377	Case 2 Miss E. W.	23	11/13/13	Difficulty since onset of periods; very bad 2 yrs.	Moderate; anemic.	Repeated curettages; medicinal; resection of ovaries.	Normal organs; normal endometrium.	12 mg. 7¼ hrs.	None	None	Normal regular periods since treatment.
361	Case 3 Miss E. N.	16	11/ 4/13	2 yrs. since onset.	Quite severe.	Curettages; general medicinal.	Normal organs; normal endometrium.	60 mg. 12 hrs.	None	None	Normal regular periods up to present time.
186	Case 4 Miss A. R.	19	6/ 4/13	1 year	Continuous; not particularly severe; anemic.	Curettement; medicinal.	Normal organs; excessive endometrium; polypoid.	55 mg. 24 hrs.	No menstrual periods for 2 months; some abdominal tenderness.	None	Normal menstruation has returned; patient in splendid condition.
30	Case 5 Miss H. B.	20	2/ 7/13	Several years' irregular bleeding.	Very severe; complicated by organic heart disease.	Curettement; medicinal.	Normal organs; normal endometrium.	400 mg. 7 hrs.; abdominal application.	Nausea; slight rise in temperature.	None	Complete cessation of menstruation; artificial menopause. Some menopausal symptoms.

thesia; this is indispensable to good work. The amounts used intra-uterine in the fibroid cases have varied from 30 mg. to 560 mg. and the time of application from one and one-half hours to forty-eight. In the young girl class the amount of radium introduced has been as small as 12 mg. In speaking of milligrams radium element is meant; whatever the salt and whatever its purity, in all reports the amount in equivalent of radium element pure should be given. In the case of mesothorium, which varies with age, the strength equivalent to radium element at the time of radiation should also always be stated.

In conjunction with Dr. Robert M. Lewis and other workers of the Howard A. Kelly Hospital we have been using radium in the treatment of these bleeding cases for a year and a half and have had in all 39 cases: 8 hemorrhagic metropathies, 5 polypoid endometria, 5 irregular bleedings in young girls, and 21 cases of uterine fibroid tumors. All of these latter have belonged to the class of large or medium tumors, none to the group of small tumors to which the treatment is limited by Chéron.

In the first group, that of bleeding uteri of adult women without any demonstrable pathologic lesion, the eight cases are summarized in Table 1. The average age is 38 years, the youngest 27, the oldest 44. All were suffering from anemia and had not yielded to the palliative measures previously applied. The amounts of radium used varied from 60 to 268 mg., the time of exposure from two to twenty-four hours. In two cases (7 and 8) the bleeding never recurred after the first treatment. In one case (3) a second treatment was necessary. In the remaining 5 cases a normal menstrual period followed at the regular time to be followed by complete amenorrhea. The average time from treatment to complete amenorrhea was 3½ weeks. Mild menopausal symptoms occurred in 3 cases, marked menopausal symptoms in one case, and none in 4 cases. The patients all left the hospital within forty-eight hours and except for a slight abdominal burning which lasted two or three weeks and which was accompanied by some leukorrhea, have had no bad results. All now report themselves in good health.

In the third group, of adult women with uterine hemorrhage and no disease except a polypoid endometrium, there are 5 cases the details of which are given in Table 3. The average age was 43 years; the oldest 49 years, the youngest 35 years. Except in Case 1, in which a combined uterine abdominal and vaginal application was used, only the intra-uterine method was used. The amount of radium employed varied from 100 to 30 mg. The duration of the treatment was from twenty-two to seven hours. With the exception of Case 1, in which bleeding led to hysterectomy five days after application, all were relieved at once by the single application. All these patients were anemic, all had resisted other forms of treatment, all have regained their normal condition since treatment. In 2 cases menopausal symptoms were slight. In 2 cases they were not present. Case 1 is not included as here oophorectomy and hysterectomy was carried out.

In the second group, which includes young girls who were bleeding, there are 5 cases, the tabulation of which is given in Table 2. The ages varied from 13 to 23, the average being 18 years. In addition to the usual medicinal treatments, all but one had had curettages and one had had a resection of the ovaries, with

TABLE 3.—THIRD GROUP: BLEEDING UTERI FROM POLYPOID ENDOMETRIUM

No.	Name	Age	Date	Duration	Severity	Previous Treatment	Pelvic Examination	Treatment	Immediate Results	Complications	Final Results
129	Case 1 Mrs. R. L.	49	2/16/13	3 years	Intermittent; very severe; marked anemia.	Medicinal; local applications; curettage.	Normal organs; excessive endometrium; polypoid.	50 mg. in uterine cavity; 100 mg. in vagina; 100 mg. on abdomen 22 hrs.	Marked nausea and vomiting for 24 hrs.	Continued hemorrhage; hysterectomy on 5th day; abdominal tenderness 3 weeks.	Well-marked menopausal symptoms.
88	Case 2 Miss N. H.	35	5/24/13	1 year	Quite severe; marked anemia.	None	Normal organs; excessive endometrium; polypoid.	30 mg. 18 hrs.	Nausea a day or two; uterine discharge 1 month.	None Abdominal tenderness 2 weeks	No menstruation since treatment; no menopausal symptoms.
245	Case 3 Miss J. W.	47	6/24/13	9 months	Rather severe; marked anemia.	Medicinal only	Normal organs; polypoid endometrium.	70 mg. 16 hrs.	Slight nausea	None Abdominal tenderness several weeks.	No further bleeding; menopausal symptoms mild in 2 months from treatment.
271	Case 4 Mrs. A. H.	40	7/14/13	2 months	Continuous; severe; marked anemia.	None	Normal organs; polypoid endometrium.	50 mg. 24 hrs.	Nausea and vomiting 1 day.	No further menstrual periods; slight menopausal symptoms; abdominal tenderness 1 month	No further menstruation; slight menopausal symptoms.
758	Case 5 Mrs. A. B.	43	3/ 4/14	4 or 5 years	Very severe Marked anemia.	Medicinal; frequent curettages; reduction of uterus by operation.	Small normal uterus; other organs normal; polypoid endometrium.	100 mg. 7 hrs.	Nausea; slight headache	None	Entirely well; no menopausal symptoms.

the idea of diminishing the period. All were in general good condition except for the anemia, with the exception of Case 5, in which there was extreme organic heart disease. The amount of radium used varied from 12 to 60 mg. The time of application ran from five to twenty-four hours. In the first three cases the menstrual periods have returned to the normal type and the patients recovered a normal hemoglobin content.

In Case 4 there was amenorrhea lasting two months, then a return of menstruation, which has been a little irregular at intervals of from three to five weeks but never excessive. In the fifth case, where the application was through the abdominal wall, complete amenorrhea with distinct menopausal symptoms was produced. Where we desire to diminish hemorrhage the treatments are short and the milligrammage small, although it is harder to produce a complete amenorrhea in this group than in women over 40.

In the fourth group, which includes the fibroids, there are 21 cases; the average age is 44; the oldest 59 years; the youngest 32 years; menorrhagia, mettrorrhagia or both, were present in 19 cases; in one there was normal menstruation, in one no menstruation, as patient was six years past menopause.

The tumors with one exception (Case 10, Table 4) were either large or middle sized. By large we mean those reaching half way to the umbilicus or larger, while middle-sized tumors include those from the size of a two and a half months' pregnancy half way up to the umbilicus.

In 3 cases the tumor was definitely submucous. With the exceptions of Case 5, in which there was an ovarian cyst, and Case 16, a cystic ovary, and Case 20, chronic pelvic inflammatory disease, and Case 8, marked exophthalmic goiter, and Case 10, infection of the tumor and uterine cavity, the fibroid condition was uncomplicated. The amounts of radium and the duration of the application are shown in Table 4.

In Case 8 the application was atypical, in that radiation had been given with the Roentgen ray both prior to and after the radium radiation. Owing to the extreme illness of this patient the ordinary technic was not followed and the application was made through the abdomen. In Case 21, the only failure in the group, the application was also atypical, from the abdomen and from the cervix. At the time this patient was treated it was not realized that the intracervical treatments require much longer times of exposure. Here, owing to the tortuosity of the cervical canal, the introduction of the tubes into the uterus was difficult. After the failure, however, it was thought better not to radiate further, but to treat surgically.

These patients almost invariably suffer from nausea for twenty-four hours, and from abdominal tenderness for from ten days to three weeks, and some of them have leukorrheal discharge for a few weeks. The symptoms above enumerated have been much less marked when large amounts of radium are used for relatively short times. In only one case, No. 20, has any serious complication followed the treatment. Here an inflammatory process was lighted up and a pelvic abscess formed. It healed, however, without operation, and the patient is perfectly well to-day.

EFFECTS ON HEMORRHAGE

In 16 of the 21 cases, complete amenorrhea has been obtained; immediately after the treatment in 6 cases, at the end of one month in 4 cases, at the end of two months in 4 cases, at the end of several months in one case (3) in which the milligrammage and hours were small. In one case the patient is six years beyond the menopause and there was no bleeding. In one case, No. 21, the treatment failed. In one case, the time since treatment is too short to state the effect. In two cases, and these in our opinion are most important, *the menstrual periods have persisted regularly and the tumors have disappeared.* The details of these two are shown in Table 4, Nos. 4 and 11.

This happy result must be due to the fact that the fibroid has received much more intense radiation than the ovaries, and serves to point the way in which to extend our efforts in this field, that is, *to secure a maximum effect on the tumor with a minimum treatment of the ovaries.* This observation, which reverses the European technic, is possibly applicable to Roentgen ray as well as radium treatments.

The effects on the tumor are as follows:

Case 1, from the size of three months' pregnancy to six weeks' pregnancy.

Case 2, tumor 4 inches in diameter has completely disappeared.

Case 3, tumor 6 inches in diameter has completely disappeared.

Case 4, uterus and tumor size of three month's pregnancy reduced to size of normal uterus.

Case 5, tumor 9 inches in diameter reduced to one 4½ inches in diameter.

Case 6, a huge tumor filling pelvis and lower abdomen has entirely disappeared.

Case 7, uterus and tumor size of a two months' pregnancy reduced to the size of a normal uterus.

Case 8, no report on size of tumor, except that it is markedly smaller.

Case 9, huge tumor filling pelvis and abdomen to umbilicus reduced to the size of a two and one-half months' pregnancy.

Case 10, uterus and tumor the size of three months' pregnancy now a normal uterus.

Case 11, tumor reaching to within 1 cm. of umbilicus reduced to the size of a six weeks' pregnancy.

Case 12, tumor 5 inches in diameter reduced to 2½ inches in diameter. Duration of observation only six weeks.

Case 13, no report obtained.

Case 14, tumor 6 inches in diameter reduced to 1 inch in diameter.

Case 15, tumor size of four months' pregnancy reduced to that of a six weeks' pregnancy.

Case 16, tumor size of four months' pregnancy reduced to one of six weeks' pregnancy.

Case 17, uterus size of three months' pregnancy reduced to a normal uterus.

Case 18, huge tumor filling pelvis and lower abdomen to umbilicus reduced to one-third original size.

Case 19, six years past the menopause, tumor 6 inches in diameter reduced to one 3 inches in diameter, and still decreasing.

Case 20, uterus twice normal size, reduced to normal size.

Case 21, practically no change in size of tumor which is about 4 cm. in diameter.

With intense radiation of the fibroids, the reduction is usually rapid, occurring within two or three months. Where the principal effect has been on the ovary, the disappearance may be much slower extending over months or even years, as in the cases reported by Robert Abbé.[6, 7]

TABLE 4.—FOURTH GROUP: MYOMATA UTERI

No.	Name	Age, Yrs.	Date	Duration	Hemorrhage	Size and Position of Tumor	Condition of Other Pelvic Organs	Treatment	Immediate Results	Complications	Final Results
0	Case 1 Mrs. E. R. W.	45	3/18/13	6 months	Menorrhagia, 10 days; clots profuse; some anemia.	Subperitoneal and interstitial uterus and fibroid size of 3 months' pregnancy.	Normal	30 mg. for 48 hrs.	Nauseated 24 hours. No fever. Abdominal discomfort several weeks.	None	Leukorrheal discharge for 2 months. Moderate period in April and May, none since. Uterus size of 6 weeks' pregnancy. General health splendid. Marked menopausal symptoms.
55	Case 2 Miss E. G. E.	35	3/23/13	1 year	Menorrhagia, excessive, 10 days; moderate anemia.	Interstitial; 4 inches in diameter	Normal	30 mg. 48 hrs. 3/25/13 38 mg. 48 hrs. 5/1/13 55 mg. 24 hrs. 1/1/14	Nauseated headaches and leukorrhea.	None	Good deal of pain and aching in the back and abdomen. Between May and November regular 3-day periods, scant. Excessive in December. Uterus slightly smaller. No period after January. Uterus normal. Feels splendidly.
175	Case 3 Mrs. F. P.	44	5/17/13	1 year	Rather marked; 7 or 8 days; menorrhagia.	Interstitial; indistinguishable from uterus; 6 inches in diameter; one-half way between symphysis and umbilicus.	Normal	80 mg. 24 hrs.	Some nausea and vomiting for 24 hours.	None	Moderate flow in June, 1 day in July. No further bleeding. Mild menopausal symptoms. Uterus normal in size. Most of the decrease before December, 1913.
119	Case 4 Miss K.	46	5/27/13	4 months	Menorrhagia, 10 days.	Just reaching out of the pelvis; interstitial; little larger than a 3 months' pregnancy.	Normal	50 mg. 24 hrs.	No discomfort.	None	Missed June period; moderate menstruation in July. No menstruation between July and November. In November fibroid plainly felt in anterior wall 4 cm. in diameter. From December on regular menstrual periods of 3 days' duration. Fibroid entirely gone.
274	Case 5 Mrs. A. A. W.	51	7/22/13	3 years	Menorrhagia; marked anemia apparent.	Interstitial, subperitoneal, submucous; cross diameter 9 ins.; extends far up in abdomen.	Ovarain cyst of right ovary 18 in. in diameter.	60 mg. 47 hrs.	Nauseated for 48 hours. Abdominal distress for several weeks mild.	None	No further hemorrhage whatever. By October 25 fibroid reduced to one-half original size. Entirely intrapelvic. Ovarian cyst no more than 1½ inch in diameter. Same condition in June, 1914.
281	Case 6 Miss M. B.	33	8/25/13	2 years	Marked menorrhagia.	Interstitial and subperitoneal; fills entire pelvis and extends 4 fingers above umbilicus.	Normal	120 mg. 18 hrs.	Nauseated, vomiting, some temperature for some days.	For nearly 2 mos. marked discharge; some afternoon temperature	Irregular bleeding for 2 months. Then complete cessation. Very mild menopausal symptoms. Splendid general health. Tumor entirely disappeared.
324	Case 7 Miss E. B.	43	10/ 4/13	2 or 3 years	Menorrhagia 10 days; very low hemoglob.; metrorrhagia for 1 month before treatment.	Interstitial and subperitoneal; uterus size of 2 months' pregnancy; one subperitoneal nodule 1 inch in diameter.	Normal	80 mg. 24 hrs.	Nauseated for 24 hours. Some leukorrhea and abdominal tenderness for 4 weeks.	None	One moderate period in December. Complete amenorrhea. Uterus normal in size. Slight menopausal symptoms. General health splendid.
332	Case 8 Mrs. M. M.	40	10/ 7/13	4 years	Menorrhagia and metrorrhagia; hemoglobin 40 per cent.; condition of exophthalmic goiter complicates situation.	Subperitoneal, interstitial, and submucous; immense tumor filling entire pelvis and lower abdomen to level of umbilicus.	Not made out.	Abdo. 734 mg. 6 hrs. 484 mg. 4 hrs.	Thyroidism, nausea and vomiting for a week. Rather high fever.	Thyroidism	Patient had Roentgen-ray treatment by Dr. Stern of New York. Although tumor decreased, bleeding continued in November and December. Further Roentgen-ray treatments were given by Dr. Stern. Amenorrhea reached in January. Since then no bleeding. General health has been excellent. Tumor reported to be much smaller.

TABLE 4.—FOURTH GROUP: MYOMATA UTERI—(*Continued*)

475	Case 9 Miss A. D. S.	48	1/ 4/14	4 years	Marked menorrhagia; metrorrhagia; marked anemia; 30 per cent. hemoglobin; foul discharge; daily fever.	Fills pelvis, lower abdomen to umbilicus.	Not made out	100 mg. 12 hrs. April 25 on abdomen 1,100 mg. 1 hr. 40 min.	Marked nausea; fever for 10 days; purulent discharge from uterus.	None	Since the treatment in January no hemorrhages. On several occasions slight bleeding. *Uterus now size of 2½ months' pregnancy, freely movable.* Hemoglobin and general condition excellent.
637	Case 10 Miss O. F. F.	40	2/22/14	7 years	Menorrhagia and metrorrhagia; marked anemia and general symptoms from anemia; shortness of breath; hemoglobin 50 per cent.	Uterus size of 3 months' pregnancy; 1 small nodule felt on posterior surface.	Normal	100 mg. 10 hrs.	Nausea and considerable upset for 2 days; abdominal tenderness and miserable feeling for 6 weeks which kept her in bed.	None	No menstrual period after a moderate one in March. Reports she is feeling splendidly, better than for years. The growth has entirely disappeared.
681	Case 11 Miss B. S.	39	3/16/14	About 1 year	Menorrhagia and metrorrhagia; marked anemia.	Subperitoneal, interstitial and submucous, reaches to 1 cm. of umbilicus.	Normal	300 mg. 1½ hrs. April 25 1,100 mg. 2½ hrs. on abdomen.	Twenty-four hours nausea; soreness in abdomen for 10 days; temperature 1 degree above normal for 8 hrs.	None	Normal menstrual periods in March, April, May and June. On April 25 growth one-half original size. *On June 14 growth found to be entirely gone.*
825	Case 12 Mrs. A. L.	38	4/30/14	1 year	Menorrhagia, marked.	Uterus size of 6 weeks' pregnancy; attached to its right wall is a fibroid 5 in. in diameter filling the right broad ligament.	Normal	560 mg. 3 hrs.	Little nausea	None	Rather profuse menstrual period in May. None up to present time in June; *growth is about half original size.*
771	Case 13 Mrs. L. H. C.	44	4/20/14	1 year	Menorrhagia 10 days, but not very anemic looking.	Interstitial, 15 cm. in diameter, reaches half-way to umbilicus, fills pelvis.	Normal	400 mg. 1½ hrs.	None	None	No report secured.
333	Case 14 Mrs. C. N. B.	42	10/ 8/13	4 years	Menorrhagia	Interstitial; uterus and tumor inseparable; fully 6 in. in diameter; reaches half-way to umbilicus.	Normal	60 mg. 24 hrs. 300 mg. 21 hrs. from abdomen.	Nausea 3 or 4 days, marked discomfort in pelvis for 1 month.	None	No further menstrual period; general health splendid; uterus normal in size, small, attached to its right wall; a small pedunculated myoma 1 in. in diameter.
334	Case 15 Mrs. C. E. D.	40	10/20/13	2 years	None	Interstitial; inseparable from uterus; size of large cocoanut; reaching almost to the umbilicus.	Normal	100 mg. 26 hrs. 60 mg. on abdomen 1½ hrs.	Nausea for 24 hours.	None	Normal menstrual period in November; none since then; general condition splendid; no menopausal symptoms; tumor practically gone; uterus freely movable; slightly larger than normal; no fibroid can be felt.
370	Case 16 Mrs. H. W. T.	59	11/ 6/13	4 years	Although 59 yrs. old patient is apparently still menstruating; for 4 years has been having irregular excessive menstrual periods.	Interstitial; size of 4 months' pregnancy; reaches half-way to umbilicus.	Apparently cystic left ovary.	100 mg. 24 hrs.	No upset.	None	No further bleeding; splendid health; growth reduced to one-third original size.
394	Case 17 Mrs. A. McG.	46	11/18/13	2 years	Rather marked menorrhagia; symptoms of pressure.	Uterus size of 3 months' pregnancy; freely movable; growth interstitial.	Normal	60 mg. 17½ hrs. 60 mg. 2 hrs., 1/6/14.	Period in December, rather excessive; none since.	None	Feels splendidly; no menopausal symptoms; no bleeding; tumor entirely gone.
375	Case 18 Mrs. W. T. D.	33	12/10/13	1½ years	Menorrhagia 8 days.	Interstitial, subperitoneal, irregular; fills pelvis and lower abdomen.	Not made out	60 mg. 18½ hrs.	No disturbance.	None	One menstrual period; since then complete amenorrhea; growth reduced to one-third original size; splendid health.

TABLE 4.—FOURTH GROUP: MYOMATA UTERI—(*Continued*)

No.	Name	Age	Date	Duration	Hemorrhage	Size and Position of Tumor	Condition of Other Pelvic Organs	Treatment	Immediate Results	Complications	Final Results
792	Case 19 Miss M. L. C.	49	4/25/14	At least 10 years.	None. Patient is past menopause 6 years.	15 cm. in diameter, in right broad ligament; uterus to left of tumor; size of 6 weeks' pregnancy.	Normal	150 mg. 6 hours	None except leukorrheal discharge.	None	June 5 tumor only 7 cm. in diameter; general condition of patient excellent.
614	Case 20 Mrs. A. H. M.	46	2/ 6/14	1 year	Very marked menorrhagia; marked anemia.	Uterus about twice normal size; one subperitoneal fibroid on anterior wall measures 4 cm. in diameter.	Pelvic inflammatory disease; chronic	170 mg. 13 hrs. 15 min.	Nausea and vomiting; some temperature; abdominal pain for 3 weeks.	Lighting up of pelvic inflammatory disease with formation of pelvic abscess.	No further menstrual periods; pelvic abscess healed spontaneously; no menopausal symptoms; uterus normal in size; general condition splendid.
340	Case 21 Miss A. A.	32	10/ 8/13	2 years	Menorrhagia 5 days.	Uterus 10 cm. in diameter, round and globular.	Normal	30 mg. 25 hrs. 10/19/13 300 mg. 11 hrs., abdominal 10/19/13 35 mg. 10 hrs. 11/18/13 35 mg. 12 hrs. 11/20/13 60 mg. 25 hrs. 1/7/14 400 mg. 6 hrs. abdominal 1/7/14	No upset except nauseated a few hours after application.	None	Neither tumor nor hemorrhages markedly changed. The applications here were to the cervix and not intrauterine. Radical operation carried out 3/14/14.

CONCLUSION

We feel sure as the result of these remarkable experiences that radium offers a marvelous means for controlling, as well as for completely doing away with uterine hemorrhages, in the classes of cases cited.

We believe also that it is perfectly suited to secure the disappearance of fibroid tumors. A radium treatment ranks in severity as scarcely more serious than a simple uterine curettage.

In its brilliancy of curative results it is fully equal to radical surgical procedures while offering the advantages of freedom from danger, pain, suffering and the various postoperative complications and sequelae. Furthermore, when radium fails we still have the operation to fall back on and have not lost in the waiting. As compared with the Roentgen ray, radium is simpler of application, more rapid in bringing about the desired effect, and finally is better in that it acts on the diseased organ, the uterus, with more intensity than on the ovaries. Radium offers the possibility in the fibroid cases of doing away with the tumor without destruction of the ovaries.

We also insist that the fibroid itself should receive the major radiation, whether with the Roentgen ray or with the radium.

The radium can bring about a complete amenorrhea at any age.

The menopausal symptoms which follow this amenorrhea are absent in 50 per cent. of the cases and mild in nearly all of them.

We insist on the intra-uterine application, in contradistinction to the vaginal or cervical, and in this connection wish to contrast the shortness of the radiations in hours as compared with the exposures reported by Chéron[8] and Gauss and Krinski.[9] We feel that it is quite possible that suitable abdominal radiation with radium or the Roentgen ray may add to the rapidity of the results.

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ROENTGENOTHERAPY IN UTERINE HEMORRHAGE *

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The treatment of uterine hemorrhage by means of the Roentgen rays, is no longer a novelty, but has become an established method in most of the leading clinics in Europe, and is being well established in America. The first cases were treated and placed on record ten years ago by Deutsch. Since then reports have been made by several hundred roentgenologists and gynecologists, and the number of cases now definitely recorded are considerably over a thousand. There has been sufficient time for all the doubts and fears to have materialized, but instead, all hopes have been realized, the technic has been fairly well established, and the indications and contra-indications reasonably well outlined, so that to-day the method stands as one of the most brilliant achievements of roentgenology.

In 1904 Deutsch[1] found that the rays relieved four cases of uterine hemorrhage connected with fibroids. This report seemed to have been forgotten until

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1. Deutsch: Die Radiotherapie bei Gebärmuttergeschwülsten, München. med. Wchnschr., 1904, p. 1646.

Foveau de Courmelle[2] made a report on forty-five cases of uterine fibroids in 1906, and on fifty-three in 1907. I[3] began treating these cases in January, 1906. Since then the publications on this subject have been so numerous that it would require all the time allotted to me for this paper, if I only referred to them.

THEORY OF THE ACTION OF THE ROENTGEN RAYS IN GYNECOLOGY

It has been proved by experiments on animals and human beings (Albers-Schonberg,[4] Phillips,[5] Halberstaedter,[6] Heineke,[7] and others), that the ovaries and testicles are the most sensitive of all the tissues of the body to the action of the Roentgen rays, and that these organs can be seriously affected without producing visible effects on the overlying skin. It is likely that the results referred to in this paper are chiefly due to this special action of the rays on the ovaries, and secondarily to their direct effect on uterine fibromas, the uterine tissue, and malignant cells, when present.

If the activities of the ovaries send out a stimulus to prepare the mucous membrane of the uterus for the reception of the ovum, and the degree of this stimulation governs the menstrual flow, then the depression of this function will decrease the menstrual flow and finally lead to its obliteration. This lack of congestion and nutriment probably leads to an atrophy of the fibroids. By decreasing the hemorrhage, at least such pains as are due to the expulsion of the clots will be relieved, and by decreasing the functions of the ovaries there is probably a decrease in the irritability of the nervous mechanism of the ovaries, thus bringing about, consequently, a relief in the dysmenorrhea of neurotic subjects.

Saretzky,[8] in a series of experiments on sixty-two rabbits, found the ovarian tissue to be especially sensitive to the rays, and, of the ovarian tissue, the ripe and ripening follicles were first affected. Only the weakest dose showed no effect. Progressively increasing doses affected, in proportion to the quantity of treatment, first the ripe and ripening follicles, then the prefollicular cells and, finally, the interstitial tissue.

At certain stages he found that a beginning atrophy of the follicles undergoes a regeneration, the ovarian tissue develops anew and the ovaries entirely regain their functions. If the treatment is persisted in, however, a complete atrophy takes place. He found that if only one ovary was treated, the other ovary and the entire genital tract retained their normal functions, and the animal was capable of reproduction.

Based on these theories and experiments, we easily find the explanation of the fact that, as we approach the menopause, the quantity of treatment needed to produce sterility and an artificial menopause is very much less than is needed in younger patients in whom the functions of the ovaries is very much more active, and the resistance greater. The resistance of the ovaries in younger people is sometimes remarkable, and on this account the Roentgen-ray treatment is not the method of choice in patients under 40 years of age. One patient, aged 34, whom I treated over the spleen and abdomen for chronic cyanotic polycythemia and who received a great deal of treatment over the pelvic region during two and a half years, became pregnant and gave birth to a healthy child who is now 4 years old.

Good results of roentgenotherapy, as given by Albers-Schonberg in 1909 and confirmed by myself and many others, are as follows:

1. A cessation of the menses, and associated with this (*a*), a decrease in the size of the myomas; (*b*) a decrease or cessation of the hemorrhage associated with myomas, whether it be menstrual or intermenstrual; (*c*) a disappearance of the pains associated with myomas; (*d*) a cessation of preclimacteric hemorrhages or pains, whether due to myomas or not; (*e*) sterilization when indicated.
2. The obliteration of postclimacteric hemorrhage.
3. Disappearance or healing of myomas unassociated with bleeding, such as occurs after the menopause.
4. The control of menstrual disturbances at any age, at times without sterilization and, when necessary, with sterilization.

INDICATIONS AND CONTRA-INDICATIONS

The treatment of uterine hemorrhage by means of the Roentgen rays really consists in the treatment of the causes of the hemorrhage, and, I believe, of first importance, is a careful diagnosis made by a competent gynecologist or by one who is capable of making an accurate diagnosis. There is still some difference of opinion as to the indications and contra-indications for treatment. Those who are most skilful, and who have had most experience, are generally most enthusiastic. As a result their indications cover a wider field, and the contra-indications are fewer.

Indications in Hemorrhages Due to Myomas.—1. All cases of myoma in older women in whom there is already a well-advanced anemia, which may be the cause of an anemic heart. 2. All elderly and young women with myomas, in whom there is marked organic heart-disease, diabetes mellitus, chronic nephritis, marked lung-disease and goiter with cardiac symptoms. 3. All patients beyond the age of 40, in whom there is no contra-indication to the treatment. In general, the older the patient, and the nearer she has approached the menopause, the more prompt and satisfactory will be the result. Under 40, roentgenotherapy is not the method of choice, but good results can be obtained, though the younger the patient, the more treatment will be required. 4. The intramural, or the interstitial variety of tumor gives the best results.

Contra-Indications.—1. All cases of myomas in which the tumor is pedunculated, or which can be excised without destroying the reproductive powers of the patient. 2. Fibroids that have undergone malignant degeneration, or that have become gangrenous, should not be treated. 3. Fibroids associated with disease of the adnexa. 4. Fibromas which are producing such marked symptoms that the patient is endangered more by waiting two or three months for results of roentgenotherapy, than by the result of an operation.

RESULTS TO BE EXPECTED IN THE TREATMENT OF FIBROIDS

The decrease, or cessation of the hemorrhage, is the first result to be expected. The effect is more

2. Foveau de Courmelle: Action atrophique glandulaire des rayons X, Compt. rend. de l'Acad., 1907, cxl, No. 9, p. 606.
3. Pfahler, George E.: Roentgen Therapy in Gynecology, New York Med. Jour., June 25, 1910.
4. Albers-Schonberg: Ueber eine bisher unbekannte Wirkung der Röntgenstrahlen auf den Organismus der Tiere, München. med. Wchnschr., 1903, l, 1859.
5. Phillips: Die Röntgenbestrahlung des Hoden des Mannes, Fortschr. a. d. Geb. d. Röntgenstrahlen, viii, 114.
6. Halberstaedter: Die Einwirkung der Röntgentstrahlen auf Ovarien, Beri. klin. Wchnschr., 1905, No. 1.
7. Heineke: Ueber die Einwirkung der Strahlen auf Tierische Organe, München. med. Wchnschr., 1903, No. 18, 1904, No. 18.
8. Saretzky: Durch Röntgenbestrahlung der Ovarie hervorgerufene Amenorrhea, Ref. Geb.-Gynäk. Gesellsch. in St. Petersburg, Nov. 20, 1908; Fortschr. a. d. Geb. d. Röntgenstrahlen, Nov. 20, 1908, p. 42.

prompt the older the patient, or the nearer the menopause has been reached. Generally there is a decrease or cessation of the flow within a month or two after the first two series of the application of the rays. At times, after the first series of treatments, there may be an increase in the hemorrhage; in fact, the two subsequent menstrual periods may at times be increased. Generally, the first menstrual period following the first series of irradiations is not decreased and is at times increased. The second period, which usually follows the second series of irradiations, is usually diminished and the third menstrual period commonly disappears. The increase in hemorrhage following the first series of irradiations, is due to the stimulating effect of the rays on the cells. Following this the vitality of the cells is depressed, and finally destroyed. Increase in hemorrhage is more often observed with the subserous variety of fibroids, and in patients who are very anemic. Therefore, when one begins treatment in this class, there should be a special effort made to place the patient in bed following the treatment, and the attending physician should be prepared, if necessary, to tampon the vagina. In none that I have treated has this been necessary.

In patients beyond the age of 40, there are usually required from three to six series of irradiations given in from three to five months. The number of series will depend somewhat on the number of doses, or amount of treatment, given in each series. In patients under 40, considerably more treatment will be needed than in the older patients, and at times it seems only possible to stop the intermenstrual flow, and restore the menses to a normal quantity. At times the cessation of hemorrhage is almost miraculous. In one patient, the bleeding, which had been constant, stopped after the application of one full dose. With the establishment of permanent amenorrhea or an artificial menopause, the patient is likely to have the same group of symptoms which occur with a normal menopause. They are more likely to occur if the menopause has been produced rapidly. In my cases only three patients complained of such symptoms as flashes of heat, a dull headache and restlessness.

With the cessation of hemorrhage, the general health improves, the patient regains color, weight, strength and appetite; sleep improves and the hemoglobin and red corpuscles increase to nearly normal. Albers-Schonberg urges most strongly that each patient have a record made, at the beginning of treatment, of the amount of hemoglobin and the weight. Both the hemoglobin and the weight should be recorded repeatedly during the course of treatment, for if there is no increase in the weight and hemoglobin, he thinks we are justified in understanding that the case is not purely one of myoma, but should always make one suspicious of a malignant disease. One must, of course, bear in mind that other conditions than that of malignancy may be the cause of loss of weight, and it is only when one cannot account for the loss of weight by any other means, that it should be attributed to a possible malignancy.

The tumor is usually the last to show any effect. Occasionally it decreases in size before the bleeding ceases. Generally there is a decided reduction in the size of the tumor at the time of cessation of treatment, and the reduction continues from this time forward. For instance, if the tumor extends to the umbilicus at the time of beginning of treatment, at the end it may be the size of an orange. The tumor continues to decrease in size long after the cessation of treatment. In one case, the tumor originally extended to the umbilicus. At the end of two years it was the size of an orange, and at the end of five years had disappeared. In another case, the tumor originally extended to the umbilicus. At the end of two years it was very much reduced, and at the end of four years it could not be found. In 75 per cent. of my patients who have ceased treatment, the tumor has disappeared. With a decrease in the size of the tumor, the pressure symptoms disappear.

The question of malignant degeneration subsequent to this treatment, has been raised. No such case has been observed.

The relief of pain will depend in great part on its cause. If it is caused by pressure of a large fibroid, the pain, of course, will not be greatly relieved until there is sufficient reduction in the size of the tumor to release the pressure. If the pain is due to hypersensitive ovaries or ovarian excitability, it will be relieved comparatively early, because the earliest effect of the rays is shown on the ovaries. Such conditions sometimes exist in dysmenorrhea. The relief of pressure symptoms, such as constipation, swelling of the lower extremities, irritability of the bladder, etc., will, of course, await the reduction of the size of the tumor, and, since this is the latest effect to be seen, it may persist for several months after beginning treatment.

HEMORRHAGES DUE TO MALIGNANT DISEASE

Some good results have been recorded from the treatment of malignant disease of the uterus. I began the treatment of malignant disease of the uterus thirteen years ago. In the first patient I apparently obtained brilliant results, with complete disappearance of the disease, which at the beginning was an ulcerating mass filling the entire pelvis, hopelessly inoperable. The patient returned to the hospital one year later for the treatment of a severe Roentgen dermatitis, or degeneration. At this time there was no evidence of malignant disease in the pelvis.

Following this I treated, in all, fifteen cases. All were inoperable or recurrent. In all I got some reduction in the hemorrhage and some improvement in the general symptoms, but, in the end, all the cases but the first case were failures. During the subsequent eight years I then refused to treat such cases, but during the past six months I have taken new courage and enthusiasm from the general results obtained in deep roentgenotherapy.

I have under treatment now, five recurrent cases, following hysterectomy. In all there has been some improvement, some reduction or disappearance of the bloody discharge, relief from pain and improvement in the general health. One seems to have gotten well. In one other case there was no improvement, and the patient died about six weeks after the first and only series of treatments, from ulceration into the bowel. The attending physician believed that this was only the natural course of the disease and not due to the treatment, for there was no damage to the skin.

At the International Congress at London, 1913, Kroenig referred to ninety-six cases of carcinoma of the uterus which had been treated with radium and Roentgen rays, radium being used for the local effect and the Roentgen rays used over the abdomen for the general effect. In forty-six cases of these, the lesions were healed. The longest period of healing, however, had only been one and one-half years.

A review of the twenty-one cases treated by Albers-Schonberg (reported at the International Congress at London, 1913), shows encouraging results, but he feels that several years must pass before we can draw any accurate conclusions.

In general, while we now have some encouragement in the treatment of malignant disease of the uterus, it is not sufficient to justify us in recommending it to replace operation. We should, therefore, urge immediate operation in all cases in which the diagnosis is made while in an operable stage.

For the present we should only recommend roentgenotherapy in the inoperable and recurrent cases. While such cases are correspondingly more difficult, and, therefore, our statistics equally poor, we can hope to do some good in all, and each patient that recovers is just one more saved from the grave. It is to be hoped, however, that such patients will be referred immediately and not allowed to progress for months, and then in the terminal stage sent with the hope that a miracle can be performed.

I believe, too, that the results that have been obtained in the treatment of deep-seated malignant disease justify the surgeon in recommending postoperative roentgenotherapy in all cases operated on. This treatment should be given as soon as the patient can be safely removed to the laboratory. It should be given vigorously, but carefully and skilfully. The possession of Roentgen apparatus is no more a guarantee of skill in roentgenology than is the possession of surgical instruments a guarantee of skill in surgery.

METROPATHIC HEMORRHAGE

Under this heading Eymer and Menge include the following:

1. Cases of bleeding connected with disease of the uterus in which there is no tumor or none recognizable, cases of so-called "metritis."
2. Cases of hemorrhagic endometritis.
3. Climacteric hemorrhages, which are not malignant in origin. In this class of cases deep roentgenotherapy has accomplished good results, and is especially indicated.

Roentgenotherapy has also accomplished good results in some cases of hemorrhage connected with inflammatory disease of the adnexa (Menge), and is indicated in those cases in which operation is contraindicated for some reason or other.

TECHNIC

In general, the object of the treatment is (1) to depress or obliterate the functions of the ovaries, thus producing an amenorrhea or oligomenorrhea; and (2) to cause an atrophy of fibroids, if present, (*a*) by action on the ovaries; (*b*) by direct action on the tumor; (3) to cause degeneration of the carcinoma cells, which should be replaced by healthy connective tissue; and (4) to restore the bleeding mucous membrane in the metropathic cases, to a normal or healthy condition. This should be accomplished without damage to the skin, the bowels or the lymphatic glands, with a fair degree of certainty and within a reasonably short time. Therefore, the greatest attention must be given to technic. To learn this technic, one must learn the principles of roentgenography, as well as roentgenotherapy. This technic is not easily learned, or more men would know it.

The exciting instrument should give a uniform current of high voltage, and sufficient in quantity to excite any given tube to a high degree of efficiency. Previous to the development of the Coolidge tube, I preferred the high-power, high-speed static machine, 40 plates. Since the development of this new tube, which marks a wonderful advance in roentgenotherapy, I prefer the transformer type of inductor having a rhythmeur attachment, which I believe gives the greatest degree of efficiency, and enables one to give a dose in the shortest period of time. In using this very powerful type of equipment, however, special skill is necessary or harm will result. In general, any type of exciting apparatus can be used if the proper balance is maintained between the amount of current used and the proper degree of penetration of the rays from the tube, with a corresponding duration of the treatment. Therefore, the induction coil, transformer type of inductor or the static machine can be successfully used.

The tube should be one that will keep a constant high vacuum of from 7 to 8 Benoist. If the tube is allowed to get soft, the rays will be absorbed in the superficial tissues, resulting in a burn, and the deep effect on the ovaries will not be obtained. Since the development of the Coolidge tube and one or two other recent types, it is possible to adjust the degree of vacuum at will and maintain it uniformly, at the same time using a large quantity of current.

The most practical distance of the target of the tube from the skin of the patient, with our present type of holder and present shape of tubes I have found to be 8 inches. Later, I think we shall develop apparatus which will permit us to get nearer and so to get a greater quantity and more divergence of the rays, which will pass through the small area of skin.

The field of application of the rays is over the diseased area, and in the case of fibroids should be especially directed toward the ovaries, and include the fibroid from every possible direction. The rays should be confined to the area treated as much as possible. If a rapid result is desired, large doses must be given, and since one must not exceed the tolerance of the skin over any particular area, the field of application must be subdivided in such a manner that, by cross-firing, an increased dose will reach the deep tissues without affecting the skin. It is this subdivision of the skin-area which has permitted the large doses especially referred to by Gauss and Lembcke and usually spoken of as the Freiburg technic, in which they aim to give all the treatment necessary at one time. This is the other extreme of the swing of the pendulum, as compared with the often repeated, very small doses which were first used by myself and others. It has, however, landed the more conservative man into the middle-road technic, which consists in giving full doses through a number of fields at one time rather than often repeated small doses through the entire lower abdomen, scattered over a long period.

The Freiburg technic is very often spoken of in contradistinction to the Hamburg, or Albers-Schonberg technic. It must not be forgotten, however, that all the prominent roentgenologists are progressive, and what was referred to as the Hamburg or Freiburg technic a year or two ago, is not referred to as the Hamburg or Freiburg technic of to-day. The leaders of both these centers have come closer to a middle course. Albers-Schonberg, like the rest of us to-day, divides the area into a number of subdivisions, and the leaders in Freiburg are making much fewer subdivisions. At present I am guided by the size of the abdo-

men, the depth of the tissues to be treated and the extent and the nature of the disease. For instance, if I am treating a small fibroid which is entirely in the pelvis and is in a thin patient, the subdivisions and fields for the entrance of the rays can be at a minimum, and good results can be obtained by giving a series of treatments through three fields anteriorly and one field in the perineal region. On the other hand, if the fibroid is large and the abdomen thick, I commonly divide the area into twenty-five or more doses, and in carcinoma of the abdomen I at times treat through thirty-five or forty subdivisions, giving the limit of skin tolerance through each area. So, too, when one is dealing with malignant disease or when one is very anxious to produce very rapid results, the quantity of treatment given in any particular series must be correspondingly increased, and, in order to increase this total dosage, the number of points of entrance of the rays must be correspondingly increased. Generally, in the treatment of fibroids, I believe it is not desirable to bring on a very rapid menopause, for by producing this change gradually, there is given an opportunity for the system to accommodate itself to the change.

Albers-Schonberg[9] has expressed very well the present guiding principles that should govern us in the quantity of treatment, in saying that only such a quantity of rays should be applied as is necessary to produce a satisfactory result, uninfluenced by the duration of the treatment. One can readily see, therefore, that in principle, his ideas are similar to mine—that careful judgment should govern us in each particular case, and that a general rule is no more applicable to all cases in this treatment than is a general rule applicable for an operation to suit all cases.

The time required to give any particular series of treatment will depend on the character of equipment and the technic of the individual operator, as well as on the condition and circumstances of the patient. Generally I use one, two or three days to give any series of treatments, depending chiefly on the number of doses that have to be given in a series. The total dose given in any series varies from 40 to about 800 X. The interval between any series of treatments should not be less than two weeks, and I believe more safely, not less than three weeks.

In one case, in which the malignant disease had matted together all the abdominal viscera, as found by an exploratory operation, I repeated the treatment in two weeks, and in several areas obtained a severe dermatitis. Fortunately, however, these skin ulcerations are practically healed, and the malignant disease in the abdomen, so far as I can tell, has disappeared.

The favorable time for treatment is immediately after a menstrual period. When one has a choice in the matter, the treatment should at least be given ten days before the beginning of the succeeding period. If the bleeding is continuous, the treatment should be given just after the time that would correspond to a period. The skin dose, or total quantity of rays applied to the surface should be carefully measured so as to avoid burns.

A dose refers to the amount of rays that the skin will tolerate without producing more than a slight erythema. This dose, measured by the Kienbock quantimeter, is referred to as 10 X. Measured by the Sabouraud and Noire pastiles or disks, it is recognized as Tint B; or, measured by the Holzknecht radiometer, it would correspond to 10 units. As referred to in the general literature, the units 10 X (Kienbock) or 5 H. (Holzknecht) correspond to an erythema dose, given without filtration. With filtration, this dose, when measured under 3 mm. of aluminum, can be increased to from 20 to 30 X. To do this, however, one must have a tube that is giving uniform rays.

Filters should be used to cut off the rays that are mostly absorbed by the skin. For this purpose the leather filter, first recommended by myself,[10] has served well. On top of this I now add for this deep roentgenotherapy, 3 mm. of aluminum, and I place these just above the diaphragm of the tube stand.

At present I am giving a dose of 30 X through each area treated. I am not prepared to recommend this extremely high dosage for general use, and would like to add a word of caution to anyone who has not thoroughly mastered his own technic. Therefore, when I treat a case through four fields, it means that the patient is getting 120 X. If the patient is treated through 30 fields, it means 900 X. In this connection I would like to add what Albers-Schonberg has already said, that no case should receive more treatment than is necessary to produce permanent results, and without regard to the speed with which these results are to be obtained. In the treatment of malignant disease, one must use enormous doses to accomplish results.

Skin effects, in the hands of skilful operators, have been of almost no consequence. In a number of patients treated an erythema developed, and in others the skin became pigmented or tanned. These effects disappeared, leaving the skin undamaged. In a few cases a dermatitis of the first degree has been produced. In these later cases telangiectases develop in the skin about a year later. In the treatment of malignant disease, skin irritation is of secondary importance, but one should never go beyond the production of a slight erythema.

DISADVANTAGES AND ADVANTAGES OF THE TREATMENT

The disadvantages are the following:

1. The prolonged course of treatment that is usually necessary. This can be somewhat shortened by giving enormous doses through a large number of fields. If by this means the course of treatment is reduced to two or three months, it will probably only equal the time required for operation and convalescence therefrom.
2. There is danger to the overlying tissues, if the rays are not properly applied. By careful attention to the technic and exact measurements of the skin dose, this can be eliminated.
3. It has been claimed to be more expensive than operation. In a sense this is true. If one considers, however, that by this treatment the expense of board and hospital care is eliminated, both in the case of charity and private patients, and that in both instances they can go about their usual duties, I believe we must conclude that it is not more expensive.

The advantages are:

1. It is painless.
2. It avoids the shock of an operation.
3. It preserves to a certain extent, we believe, the internal secretion which is lost in a complete oophorectomy.
4. It does not interrupt the usual habits.
5. Confinement in a hospital is avoided.

9. Albers-Schonberg: Tr. Sect. Radiology, Seventeenth Internat. Cong. of Med., London, 1913.

10. Pfahler, George E.: Tr. Am. Roentgen-Ray Soc., September, 1905.

6. In the hands of a skilful operator it is without risk.

7. The menopause is brought on gradually, when necessary.

8. The amount of treatment can be graded to the needs of the patient.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. NOVAK, KELLY AND PFAHLER

DR. CHARLES C. NORRIS, Philadelphia: As I view the subject it is largely one of the study of etiology—in other words, to treat uterine hemorrhage intelligently we must be cognizant of its cause. Uterine hemorrhage is a symptom and not a disease, and no rule of thumb can be successfully employed in its treatment. If any criticism whatever can be applied to the excellent papers comprising this symposium, it is that this point has not been sufficiently dwelt on. Each case must be studied and treated individually. Some of the chief causes of hemorrhage are myomas and carcinoma of the uterus, endometrial polyps, hypertrophic thickening of the endometrium, displacements, adnexitis, ovarian neoplasm, disturbances of the functions of the various ductless glands, especially the ovary, certain constitutional diseases, especially syphilis, tuberculosis, hemophilia, chronic liver and heart, kidney and lung disease, besides other less frequent conditions. When we consider the great number of diseases which may cause hemorrhage, the importance of accurate diagnosis is apparent. As an example of this I may cite a case in which I was recently asked to perform a curettage for hemorrhage on a patient suffering from syphilis. The pelvic examination was negative and the exhibition of neosalvarsan checked the hemorrhage very quickly. A curettage in this case would have been of no benefit. The constitutional disease was what required treatment. The treatment of myomas of the uterus with radium or Roentgen rays undoubtedly has a very definite place in gynecology. No one however skeptical can fail to be convinced by the excellent results reported by Drs. Kelly and Pfahler, as well as those by Krönig and Gauss and others. Personally, however, I doubt very much if the Roentgen rays or radium will ever supersede surgery in the routine treatment of uterine myomas. The extremely small operative mortality and the excellent postoperative results are strong arguments in favor of the surgical treatment, whereas the prolonged treatment required and the expense, as well as the somewhat less certain results, are points that must be considered before Roentgen-ray or radium treatment is selected. Another important point of practical value is that carcinoma of the fundus is occasionally and indeed relatively frequently an accompaniment of myoma of the uterus. In all patients suffering from hemorrhage at or near the cancer age it is our first duty to exclude carcinoma, and this is particularly true in those cases in which the pelvic examination is negative or reveals only a slightly enlarged uterus. Dr. Kelly, you will remember, has very properly performed a curettage for the purpose of determining this point as a preliminary step before instigating the radium treatment. In closing I would again urge the necessity of studying the etiology of each individual case, for only by so doing can the proper treatment be instigated.

DR. JOHN A. MCGLINN, Philadelphia: So far as the nervous element of the bleeding from the uterus is concerned, it is not so much due to shock to the nervous system as it is to the result of the shock on some of the ductless glands. In the few cases following shock I have noticed other metabolic changes, such as falling of the hair and change in menstrual bleeding. Some time ago I sent out a letter to the members of the American Surgical Society asking whether in their opinion surgery could be eliminated in the treatment of fibroid tumors of the uterus. Eighty replied that positively it could not be. The same question was asked the Roentgenologists and eight out of 90 replied that it could be and that the Roentgen ray should take the place of surgery. I feel that we should not confuse the cure of fibroid tumors of the uterus with the relief of bleeding from fibroid tumors of the uterus. I have no quarrel with radium or with the Roentgen ray, but that surgery can be eliminated in the treatment of fibroid of the uterus I do not believe. I believe that even with the Roentgen ray and radium, surgery is still the best treatment. The mortality of surgery in these cases is due to the various complications present other than sarcomatous degeneration; so that, considering the mortality, it will be found that the Roentgen-ray treatment has not a great advantage over surgery, taking into consideration the ultimate cure. The reports given by Dr. Kelly are amazing. According to the reports gathered in the clinics in Europe, but 5 per cent. of the tumors entirely disappeared. That simply means that 95 per cent. of these tumors are in a condition to undergo complications which will bring the high operative mortality; whereas, if the cases were treated by surgery, even if 5 per cent. of the patients do die, at least 95 per cent. of the cases are cured against 5 per cent. cured by the Roentgen ray.

DR. WILLIAM S. NEWCOMET, Philadelphia: I am glad to know that when Dr. McGlinn sent out that little note, only eight out of one hundred roentgenologists decided that all tumors could be treated by the Roentgen ray. As a rule I think that roentgenologists try to be conservative, and this proportion shows well for our work. The work of Dr. Kelly and Dr. Pfahler shows that under these good reports was skill. No doubt the great trouble often in the matter of results is that many patients are treated by persons who do not understand how to use these methods. Furthermore, I am glad also to hear Dr. Kelly mention the fact that the Roentgen ray and the gamma ray are not to be regarded the same. It was twice stated in this meeting by men in other Sections that the Roentgen ray and the gamma ray are identical and that they can be used one for the other. Any one who has ever had any experience with the Roentgen ray and with radium and has seen the reaction from each, must be impressed with the entirely different process following the application of either of these methods. Also if you should have a burn or a reaction from the Roentgen ray in the same proportion as you have a reaction or burn from radium you would have a lifetime injury; whereas the reaction from radium will clear up in a very short time. It is a curious thing that abscess follows the destruction of tissue in these cases from radium. Dr. Kelly has referred to this, and I have seen it twice in my own experience. On the other hand, it is very rare to have abscess follow destruction of tissue from a Roentgen-ray burn. Dr. Kelly's results exceed any I have seen so far published. They far exceed those of the London Radium Institute, which I am in the habit of quoting because I think they are given from a very conservative basis. Another important point taken from Dr. Kelly is that his applications are directly on the tumor, while in the vast majority of cases treated by the Roentgen ray, the influence on the fibroid is from the reaction on the ovary. Curiously enough, it has been cited time and time again that in these pelvic cases treated by the Roentgen ray sterility usually follows. About ten years ago I treated for Dr. George Erety Shoemaker a patient with a large sarcoma of the pelvis about the size of a seven months' pregnant uterus. The woman recovered and became pregnant twice, the first pregnancy occurring two years after the disappearance of the tumor. The woman is now in good health.

DR. STEPHEN E. TRACY, Philadelphia: Before we can intelligently treat a case of uterine bleeding it is necessary to make a diagnosis, and this is not always possible before operation. I cannot speak of radium, as I have had no experience with it, but I want to congratulate Dr. Kelly on the wonderful results. There are those who assert that all cases of carcinoma of the uterus and all fibromyomas of the uterus should be treated by roentgenotherapy, and I trust that Dr. Kelly in closing the discussion will state his position in this matter. Dr. Pfahler has designated what cases of uterine bleeding are suitable for roentgenotherapy, and I believe that most of us will agree largely with his statements. We all know that Roentgen-ray treatment for malignant disease of the female pelvic organs has been practically worthless. In regard to fibromyomas of the uterus, it is well known that malignancy is present in from 4 to 5 per cent. of the cases. Malignancy and the

various other degenerations of fibromyomas of the uterus are found in 15 per cent. of the cases which come to operation, and such cases are not suitable for roentgenotherapy. When we add to this 15 per cent. the complications and associated conditions in the appendages, we have in between 30 and 35 per cent. of the cases conditions which would not be cured by roentgenotherapy. At least 25 per cent. of the women with fibromyomas of the uterus who have come to operation, would have perished, sooner or later, if they had been relegated to the roentgenologist. It is generally conceded that women under the age of 40 years are not good subjects for Roentgen-ray treatment. It has been clearly shown that after the age of 40 years the dangers of fibromyomas of the uterus increase with advancing years. In a collected series of approximately 700 cases I found that 70 per cent. of the degenerations took place in women after the age of 40 years, and that over 90 per cent. of the malignancies were found after that age. When all these facts are considered, the conclusion is inevitable that the best treatment for the majority of these tumors which produce symptoms is early surgical intervention, unless Dr. Kelly can cure them all for us with radium.

DR. CURTIS F. BURNAM, Baltimore: I have been studying with Dr. Kelly the cases reported. I have seen them from the very beginning and therefore have taken a very lively interest in the foregoing papers and the discussions. I incline to believe that many cases of uterine hemorrhage are really dependent on uterine and not ovarian conditions. This view is partly substantiated by a series of cases in which I operated on young girls for hemorrhage; curettage having failed to relieve them, resection of the ovaries was finally resorted to. In spite of the reduction of the ovaries the bleeding continued. In one of the group intra-uterine application of radium brought about a return to normal menstruation after operation had failed. An interesting point in connection with all these cases is the frequent absence of menopausal symptoms when complete amenorrhea has been produced by the treatment. It is quite astonishing to interview a patient who gives no history of menstrual or other bleeding and yet reports not the slightest general disturbance. Proceeding to the therapeutic questions involved in these cases, I should like to be put on record with Dr. Kelly in asserting definitely that the ray treatment will perhaps entirely replace operative surgery and will certainly do it in most cases. The treatment itself is extremely simple, without danger, is not time-consuming, and in no way prevents going on later to surgical methods if it proves unsuccessful in any given case. I should like also to say in reply to one of the speakers, that the recent reports from Freiburg of mesothorium treatment in similar conditions in every way conformed to these results here reported. Gauss and Lempke state that in sixteen fibroids radiated, fifteen have entirely disappeared and one greatly decreased. I should like also to emphasize that the effects of radiation in uterine fibroids, as also in polypoid endometritis, and perhaps also in cases of metrorrhagia hemorrhagica should be on the tumor and uterus and not on the ovaries. So far as I know no one has treated a large fibroid tumor of the uterus in which the growth disappeared within a few months after radiation and the patient continued with normal menstruation up till the cases which we report. The efforts of most European roentgenologists have been directed toward devising technic to radiate the ovaries. It has been assumed that the effect on the fibroid is indirectly through the ovaries, although many have stated that there may be an effect on the tumor itself. Our plan is to protect the ovaries and radiate the tumor. Under radiation the tumor disappears rapidly; from ovarian ablation the disappearance is slow, extending over months and years. Radium has the advantage over the Roentgen ray because it is applied inside the uterus, affects directly the tumor and to a lesser degree the ovaries. It would seem easily possible, however, to devise a technic for the Roentgen ray which will radiate the uterus and not the ovaries. I am far from saying that in a very short time results as rapid and complete cannot be gained by the Roentgen ray as well as by the radium. In polypoid endometrium amenorrhea cases cessation of bleeding was brought about immediately from the day of the treatment.

DR. GEORGE ERETY SHOEMAKER, Philadelphia: I have a word to say on the subject of any treatment which leaves the tumor in the pelvis, when there is a tumor. The complications are often more important than the tumor and bleeding is the only one of them which may be modified by the Roentgen ray. Dr. Pfahler in his interesting paper mentioned that the question of malignant degeneration had been raised but that no case had been reported. I had the experience two months ago of operating in a case to be later more fully reported which had been under Roentgen treatment by a competent operator for fibroid tumor, but which later developed sarcoma. The whole treatment by other means than hysterectomy went through seven years, first, for a year by that active electrical treatment which we no longer hear about. Then the patient had Roentgen treatment twice a week for many months and the hemorrhage stopped, as it does in some fibroid cases. She still shows purplish spots in the skin over the abdomen, due to the Roentgen ray. After five years of cessation, her tumor increased in size, she began to bleed again, and her physician, Dr. Evans, sent her to me for hysterectomy. She had a fibroid tumor of the uterus with sarcomatous degeneration scattered in various parts through it. After years of treatment she had to have the operation after all. In Dr. Kelly's series of polypoid endometritis cases there is one confusing element. He says he curetted each one before the application of radium. Of course the curet alone will in good hands stop the hemorrhage in a certain number of cases. According to his table some of the patients had not previously been curetted.

DR. GEORGE C. JOHNSTON, Pittsburgh: Dr. Kelly states that he has taken the opportunity to bring this matter before the general profession through the medium of this meeting and through the medical press. In regard to the Roentgen-ray treatment of fibromas, I am surprised at the attitude taken by some of the profession. We roentgenologists do not want to treat these cases. Our position is this: we are engaged in our work, and in walks a prominent gynecologist. He says, "Don't you see what they are doing over in Freiburg?" We perfect our technic and devote ourselves to this work and then we are blamed for taking these cases. We do not want them, but if you men will not take them, we shall be obliged to. We will treat only those cases that are referred to us by competent gynecologists who say that in their opinion these cases are better treated at the hands of a competent roentgenologist than by the surgeon.

DR. EMIL NOVAK, Baltimore: In the present state of our knowledge it is unwise to be dogmatic as to the relative importance of the uterus and ovary in the causation of functional uterine hemorrhage. Even though it be shown that uterine bleeding is caused by a local factor in the endometrium, it seems probable that the presence of this factor is in some way due to the activity of the ovary. The assumption that there is a local physiologic disturbance in the endometrium would seem to explain why curettage will sometimes relieve uterine bleeding, even though the removed endometrium is microscopically normal. In these cases it is not unlikely that the cessation of the bleeding is due to the removal of the accumulated coagulation-inhibiting substance in the endometrium. As I stated in my paper, anatomic changes in the endometrium are often, no doubt, the result rather than the cause of menstrual aberrations. We must learn to look on the endometrium as a sensitive plate which registers the more fundamental phenomena of menstruation. Certain histologic changes are now recognized as characteristic of the normal menstrual cycle, and in the same way we must learn to appreciate that various histologic pictures, abnormal as to degree or time of appearance, may be encountered when menstruation is abnormal.

DR. JOHN M. FISHER: I want to ask Dr. Kelly whether the fibroid tumors were selected cases?

DR. HOWARD A. KELLY, Baltimore: The fibroid tumors were not selected in this series. If I had any extensive abscesses or cancer of the body complicating the fibroid I would not use the radium, but would take any other case that came along. In hemorrhage cases and the fibroids with or without hemorrhage, the first thought is radium and not oper-

ation. Curettage was done at the time the patients were treated. Many of them had been curetted previously but unsuccessfully, or they would not have come into our hands for treatment for the hemorrhage. It is an entire innovation in our methods and in the matter of the benefit of the patient. The operative cures of sarcomas of the uterus are practically nil. In about 400 cases treated with radium and Roentgen rays in Freiburg there is no case on record with history of subsequent development of malignancy. In illustration as to the effect in sarcomas: A tall overgrown lad with a big tumor in the left abdomen comes for treatment. After treatment for several months, on examination nothing could be felt through the abdomen but a small mass through the rectum. Dr. Burnam took that out and it was found to be a testicle which had become sarcomatous. On the other side there were two fallopian tubes and a little uterus in between. In other words, it was a case of mixed sex elements. Something new has come into our midst and something big. We must take hold of it and see what comes of it. We are using radium every day for uterine hemorrhage, for fibroid uteri. We have radiated many carcinomas of the cervix uteri. In some cases we have later removed the uterus. In not one have we discovered any cancerous elements remaining. In one of them we found some of the pelvic lymphatic glands infected. In one case we found the glands enlarged at the operation. We have a very definite hope that we can follow these cases in a considerable series. A number of cases come to us with other ailments, such as Bright's disease, diabetes and carcinoma of the uterus, which cannot be operated on. Some have profound anemia; others tuberculosis. To all these cases radium comes as a great boon, which is going to be extended and which we hope to develop in this class of cases. It does not take such a large amount of radium that the slender pocketbook cannot afford it.

DR. GEORGE E. PFAHLER, Philadelphia: I want only to answer one or two points, one with reference to the disappearance of the tumor. I said that 75 per cent. of the tumors I had treated had disappeared, and so they have, and you must not forget that these quotations made by Dr. McGlinn are mostly based on the work of men of few years of experience. They have treated more cases than I have. The roentgenologists have been working for from eight to ten years, and that is the reason we can speak with a little greater emphasis than these men can, because the tumor continues to disappear long after the treatment has stopped. With reference to degeneration of the tumor, I inquired of the physician who treated the patient referred to by Dr. Shoemaker. The patient came weekly for treatment through the years when the treatment was much less developed than at present. He referred the patient for operation. Regarding degeneration of these tumors, it has been stated by men who know that 5 per cent. undergo malignant degeneration. If this is true, why have not 5 per cent. of those treated undergone degeneration? And if they have, do you believe that the physicians of this country have so neglected their duty that they will not call the attention of the profession to the fact that these tumors undergo degeneration later? Until we have definite data we have no right to assume that these tumors will undergo subsequent degeneration.

Insects and Disease.—When the history of medicine during the past quarter of a century comes to be written, the one outstanding feature of the period will be shown to be "the part played by insects in the spread of disease," and the application of this knowledge as a practical hygienic factor. Vermin have been "detested, shunned by saint and sinner," since the creation of man, but the reason for the abhorrence has only been proved of late years. That the mosquito can carry malaria, yellow fever and filaria; and that the bedbug, the louse, the flea, the fly, the blackbeetle, the tick, the itch insect and other vermin are agents in the transmission of a given disease is now common knowledge. This information has placed the subject of domestic and public hygiene and sanitary endeavor on a sure foundation, and given a stability to preventive measures hitherto unattainable.—*Jour. Trop. Med. and Hyg.*, April 15, 1914.

AN UNUSUAL CASE OF BROMODERMA OF THE LEG*

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Of the three halogen elements which play such a great rôle in the household of nature, bromin, discovered by Bayard in 1826, is the youngest. The others are iodin, discovered by Schele in 1774, and chlorin by Curtois, in 1812. English and French physicians were the first to use bromin and to study its action.[1] In Germany Otto Graf (1840) emphasized its sedative and depressant action on the nerve-centers. But it remained for Sir Charles Locock to introduce it in 1851, and to acquaint the profession with its main therapeutic virtues. Its position at present is that of a neuromuscular depressant and as such its main use, logically, is directed against the best-known of all convulsive diseases, epilepsy. Inasmuch as in potassium bromid the acid bromin, as well as the base potassium, has a sedative active on the nerve-centers and on the muscles, the salt is eminently fitted to cope with the explosive attacks of epileptic convulsions and hence is the most widely used of the numerous bromid compounds. It is excreted by the kidneys more rapidly than other compounds because of double decomposition in the blood, with the formation of potassium chlorid, which acts as a diuretic and increases the chlorin excretion through the kidneys. While small doses administered for a long period cause blunting of the sensory nerves, impairment of motor and diminution of reflex activity, continued large doses will cause the more pronounced depressive attacks known as bromism.

Fig. 1.—Bromoderma of leg; showing a slightly scalloped border with a few partly healed ulcerations. Lower border ends abruptly in a semi-circular line. Quiescent stage. No active symptoms at present. Leg shows smooth atrophic surface with thin easily detachable scales.

Although, as shown by Kross,[2] Albertini,[3] Nencki,[4] Fell,[5] Hoppe,[6] and especially by von Wyss,[7] Ellinger[8] and others, in chronic bromid intoxication the central nervous system has to bear the main brunt of attack, yet the symptoms of bromism are not due to a surcharge by it of these centers, but rather of the blood. It replaces with avidity the chlorin content of the blood and the gastric juice and is found in the secretory and excretory organs.[9]

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* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Sharp: Pharm. Jour., 1911, xxxiii, 128.
2. Kross: Arch. f. exper. Path. u. Pharmakol., 1876, v, 6.
3. Albertini: Arch. f. exper. Path. u. Pharmakol., 1882, xv, 248.
4. Nencki: Arch. f. exper. Path. u. Pharmakol., 1893, xxxiv, 313.
5. Fell: Inaug. Diss. Wurzburg, 1899.
6. Hoppe: Neurol. Centralbl., 1906, xlv, 266; ibid, 1908, xliv, 186.
7. Von Wyss: Arch. f. exper. Path. u. Pharmakol., 1906, xlv, 266.
8. Ellinger: Arch. f. exper. Path. u. Pharmakol., 1911, lxv, 87.
9. Ellinger: Med. klin., 1910, No. 38.

It has been shown that those organs richest in chlorin contain the greatest amount of bromin, hence blood-serum contains the greatest amount of it, next in order being mother's milk, tears, saliva and the skin. In a regimen of salt-poor diet in animals Von Wyss has demonstrated that 40 per cent. of the chlorids must be replaced by bromids to cause poisoning, and Hoppe[10] found in the gastric secretions of epileptics one-third of the chlorids replaced by bromids when the bromin influence showed itself. The antagonistic effect of these two elements is remarkable. Bromism is caused by the accumulation of bromid-ions and diminution of chlorid-ions in the blood and in all the other body juices and organs. Both conditions, it seems, are interlocking; it may be the plus of bromin or the minus of chlorin that causes the intoxication. When table-salt is withheld from the diet of epileptics they become more susceptible to the action of bromin, while abundant administration of table-salt causes the bromism to disappear by increased kidney activity.

ETIOLOGY OF DRUG ERUPTIONS

These will be encountered chiefly in epileptics as they are the principal consumers of the bromin compounds. Though almost any drug may cause an eruption, yet, for obvious reasons, those caused by the

Fig. 2.—Bromoderma of leg; showing the convex lower border and centrifugal extension of the process downward. Outside aspect of right leg. Also shows some activity yet, as seen in the healing ulceration on the upper border.

iodids and bromids have merited the greatest attention by the profession. The mode of development of these eruptions has hitherto been quite conjectural, but certain observations have brought us nearer to concrete facts, although not to perfect understanding. There are several theories extant concerning the nature and manner of drug eruptions. It is somewhat disappointing that the most natural explanation, the excretion of the "materia peccans" by way of the blood through the glandular system of the skin, is doubted.

Not many facts resting on a solid basis have been adduced to prove modern and fanciful theories. Humoral pathology in modern garb, to which we unconsciously are drifting, offers a plausible explanation. If we substitute the modern toxin for the obsolete "materia peccans" and discard the mysterious "critical sweats and eruptions" by calling them reflex phenomena or vessel changes, then we have a working basis at least approximately serviceable to explain drug eruptions. The general consensus is to call drug eruptions only such phenomena of the skin as follow the ingestion and absorption of certain drugs. Skin lesions produced by the external application of drugs are called artificial dermatitis or dermatitis venenatae. Their action is due to their irritating properties exerted on the skin, which depend on the strength of the drug; while the drug exanthems *per se* do not generally depend on dosage. Here a predisposition, a so-called idiosyncrasy, must be present, an intolerance, as it were, for the particular drug or food (crabs, strawberries, etc.). But this arbitrary division becomes untenable when we consider that drugs like salicylic acid, antimony, chloral, antipyrin, etc., may cause eruptions when used both internally or externally; while others will not cause eruptions when applied externally, but will when taken internally (strophanthus, rhubarb, etc.). Again, iodoform is taken internally without unfavorable consequences, while externally it causes great irritation in some persons. It is, therefore, impossible to systematize the etiology of drug eruptions. They may be caused in different ways, either through irritation of the skin glands or their vessels in excreting the toxic substance, or through reflex irritation of the vessels.[11]

On the other hand, external skin irritants like rhus or chrysarobin may cause very intensive constitutional symptoms. The theory of cumulative action, while it fits certain phenomena, does not explain why certain individuals will show a skin eruption very soon after the ingestion of small quantities of a drug which does not harm the great majority of others. Such a predisposition may be a lasting or a temporary one, or one becomes accustomed to skin irritants. With quinin eruptions a hereditary predisposition is observed, while in some instances such abnormal sensitiveness may be acquired and in others become lost. Kaposi[12] thinks that the vasomotor influence cannot hold good in all instances. Some rare cases of urticaria appear as soon as the provoking substance is taken into the mouth. Here the eruption can be explained only by a reflex irritation via the gustatory nerves.

Again the same drug may cause different forms of eruption in different individuals while different drugs will always cause the same form in the same person.[13] The polymorphism of these drug eruptions is one of the main features distinguishing it from other well-defined inflammatory types which they may simulate and which are dependent on a functional disturbance of the vasomotor nerves (angioneuroses). For instance, in urticaria *ab ingestis* the toxins generated by the fermentative products from the gastro-intestinal canal act on the vasomotor centers in the same manner as the irritant drug iodin or bromin.

It is, therefore, as stated before, impossible to narrow down all the enunciations of drug exanthems into a system. Neither from the point of view of the drug, nor from that of the different response on the skin is such a generalization possible. We must have recourse to more or less proved theories, namely: an especially vulnerable skin, differences in the anatomic structures or their distribution (vessels, nerves), a peculiar receptivity of the system, deviation from the normal of the position of the skin-glands, secretory and excretory alterations of their functions and many other incidents partly speculative, partly scientifically demonstrable. Predisposition for and idiosyncrasy against a certain drug, food, or external irritant are yet valid as causes but fortunately not the exclusive explanations in this contradictory domain. If I add

10. Hoppe: Neurol. Centralbl., 1906, No. 21.

11. Passini: Ann. de dermat. et de syph., 1906, vii.
12. Kaposi: Pathologie u. Therap. d. Hautkrankheiten, i, 238.
13. Joseph: Lehrbuch der Haut- und Geschlechtskrankheiten für Aerzte und Studierende, 1892, p. 120.

to these more or less plausible theories that the skin lesions are caused by the drug itself or its metabolic changes directly or by reflex action via the vasomotor or trophic apparatus, we have in a nutshell all that is known of the causation of drug eruptions.[14] Skin eruptions of a kindred type are observed also after adenoid operations, icterus, serum-therapy, etc.; here the trauma, the bile, the decomposed albuminous products are the causative agents of the skin eruptions.

SYMPTOMS, DIAGNOSIS AND PATHOLOGY OF BROMODERMA

The best evidence that drug eruptions are of angioneurotic character, caused by functional disturbances of vasomotor nerves, is the fact that they simulate almost to the point of confusion other well-known exanthems like erythema nodosum, erythema multiforme, urticaria, scarlatiniform eruptions, etc., known to be of angioneurotic origin; that fever and general systemic disturbances are mostly absent or when present appear only in a mild degree. This forms a distinctive point in the diagnosis of a drug eruption. The differentiation from the infectious angioneuroses—acute exanthems,—will not be a difficult task if we take into account their onset, development and the highly violent systemic disturbances accompanying them.

Iodin and bromin eruptions have some marked peculiarities which differentiate them from other medicinal skin lesions which show a tendency to appear either discrete or generalized. The two have very much in common and, in cases in which the vitiating drug is unknown, they may present some obstacles to a correct diagnosis. There are certain etiologic as well as clinical and histological features, however, which enable us to distinguish the one from the other in most instances.

The average bromin eruption, as is well known, starts with acne-like lesions in places where acne vulgaris usually appears. In its severer types the base of these papulopustules becomes infiltrated and the lesion appears to be raised above the surface. Soon others will appear and a patch of grouped pustular lesions clustered together become confluent in places, occupying a space the size of a silver dollar or larger. This type usually is found on the extremities, with a preference toward the lower one. This agglomeration is characteristic of bromid eruptions. Through proliferation and hyperplastic changes, tuberous, furuncular, and anthracoid formations develop which soon break down, forming fungating, papillomatous or ulcerated highly colored elevations, appearing as if a sarcoid had broken down. The borders of these elevations carry small, sieve-like perforations, giving it the appearance of a honeycomb, from which a foul-smelling smegma issues. These conglomerate patches soon become covered with greenish adherent crusts occupying large areas of several square inches, favoring the lower part of the leg, as in the case I will describe; or they may appear in discrete patches all over the body. Phlyctenular eruptions of the conjunctiva bulbi, and furuncular lesions of the external auditory canal[15] have also been observed. I have seen painful furuncles of the follicles of the vibrissae of the nostrils, causing an erysipeloid inflammation of the alae nasi. Comby,[16] Marzianni and others[17] have seen in infants bromodermas acquired through their mother's milk.

The diagnosis of a bromin eruption, if the cause is unknown, may offer considerable difficulty. Diagnosis of the discrete, acne-like or the papulopustular form necessitates the knowledge of quite a goodly number of dermatoses which they resemble. Those which are ushered in as a generalized eruption will naturally make the diagnostician consider the possibility of one of the acute contagious exanthems, but fortunately there are distinguishing points from which one may arrive at a proper diagnosis. Common to all forms is the suddenness of outbreak and in the generalized forms the violence of development, both local and systemic; the brevity of the acute stage, and the relative quickness of defervescence. In the chronic conglomerated, fungating and exulcerating forms occupying at times almost the entire lower extremity, the risk of a faulty diagnosis is imminent, and sometimes fraught with grave danger to the patient. In the oft-cited case[18] of Köbner, amputation of the leg was avoided only in the nick of time and in his case of a scarlatiniform quinin eruption a prioress was quarantined for suspected scarlet fever for weeks. In Caspari's case,[19] an alleged pemphigus chronicus turned out to be a bullous antipyrin rash. Innumerable other instances of this kind could be cited.

Fig. 3.—Inside aspect of right leg showing the same centrifugal extension as Figure 2. Note smooth atrophic scaly appearance.

The pathology of bromin eruption is that of a more or less deep inflammation and will vary with the particular form it assumes. Changes in the papillary layer, in the periglandular tissues and the vessels surrounding them, a hyperkeratosis and parakeratosis and minute abscess formation in the corium are its main characteristics. Guttman[20] was the first to demonstrate bromin in the pustule and Fox and Gibbes[21] found that the process starts in the cutis vera in the form of minute abscesses. The coil-glands show changes, but the pilosebaceous glands are slightly and only secondarily involved. Hence they declare that the so-called bromid acne is not a real acne.

While Von Wyss and Ulrich[22] consider local intolerance of the skin as the cause of bromid acne, Laudenheimer[23] declares it to be a real symptom of bromin intoxication. According to Gley[24] and Cannizarro[25]

14. Compare Neuman: Lehrbuch d. Haut Krankheiten, French translation; Auspitz: System der Hautkrankheiten, Vienna, 1881; Crocker: Brit. Med. Jour., 1893, p. 1208; Szadeck: Zur Casuistik des Bromexanthems, Arch. f. Dermat. u. Syph., 1888, xx, 599; Besnier, Broecq and Jacques: La Practique Dermatologique, ii, 480.
15. Gruber: Allg. med. Ztg., 1887, xli, 409.
16. Comby: Bromides cutanées chez les nourissons, Bull. Soc. de pédiat. de Paris, 1912, xiv, 153.
17. Marzianni: Di un bromoderma tuberoso osservato contemporaneamente nella madre e nel bambino lattante, Boll. d. Soc. med. di Parma, 1912, Series 2, v, 53.
18. Kobner: Arch. f. Dermat. u. Syph., 1873, International Dermat. Cong., Vienna, 1892.
19. Caspari: Zur Lehre von den Arznei-Auschlägen., Arch. f. Derm. u. Syph., 1894, v, 26.
20. Guttman: Virchows Arch. f. path. Anat., 1888, lxxiv, No. 4, p. 22.
21. Fox and Gibbes: Brit. Med. Jour., 1885, p. 971.
22. Von Wyss and Ulrich: Neurol. Centralbl., 1910, p. 75.
23. Laudenheimer: Zur Behandlung und Theorie des Bromismus, Neurol. Centralbl., 1910, lxxiv, 461.
24. Gley: Recherches sur le function de la glande thyroide, Arch. de physiol. et de path., April, 1892.
25. Cannizarro: Deutsch. med. Wchnschr., March 3, 1892.

bromin has a vicarious action on the ganglia almost similar to the active principle of the thyroid gland. Its administration may cause hyperthyroidism.

REPORT OF CASE

History.—A. L., aged 24, of healthy parentage, both parents living, had measles when 1 year old. At the age of 8, she contracted scarlet fever, complicated with kidney trouble and convulsions. After recovery she remained quite well for a year, when the convulsions returned. From this time on she was subject to epileptic fits, against which the use of bromids was advised. One year after the use of the drug—potassium bromid—she had acne of the face and on the border line of the scalp, and soon the right leg became the seat of a papulovesicular eruption. In the beginning discrete, later these lesions through conglomeration became confluent, occupying the middle of the tibial region, and calf of the right leg. Considerable pain and impairment of locomotion was present. One of the peculiarities of the case consists in the strange phenomenon that the eruption becomes aggravated in the fall and winter, and assumes a milder aspect or complete

Fig. 4.—Bromoderma, showing partial obliteration of the papillary pegs. Spongiosis and intracellular edema. Dilation of lymph-spaces, moderate cell infiltration.

cessation in the spring. The patient denies a more abundant use of the bromid during the winter months, asserting that, in order to avoid seizures, she uses the drug more frequently during the summer. She had no attacks for seven years. When she stopped taking bromid the attacks returned. The eruption, however, continued when medication was interrupted. For six years she has taken a patent medicine containing bromid and for the last two months she has stopped medication entirely with the result at present of the complete cessation of active skin lesions. When I first saw the patient three years ago, she had on her left leg a patch of aggregated papulopustules, on an infiltrated base about the size of her palm and covered with crusts. On the left upper thigh a fungating ulcer the size of a half-dollar was observable, which developed through the exulceration of several confluent lesions. It was very painful and bled at the slightest touch. This latter symptom will be dwelt on presently. The most interesting change occurred on the right lower limb. Here an inflamed surface presented itself, extending from the upper third of the leg down to both malleoli. The front aspect (Fig. 1) shows a crusty, slightly-scalloped border studded with a few partly healed sallow ulcerations. The lower border ends abruptly in a semicircular concave line at about the crest of the tibia. The part which now presents a smooth atrophic surface covered with thin cigarette-paper-like easily detachable scales, in the active stage showed an oozing, angry-looking surface, studded with innumerable pin-head- to split-pea-sized discrete and coalescing papulopustules considerably raised above the surface. The border of these papillomatous lesions had a honeycomb or sieve-like appearance from which a smegma-like offensive-smelling substance could be expressed. Some of these anthracoid and necrobiotic ulcerations as a remnant of former activity can yet be seen on the inner and outer border of the leg (Figs. 2 and 3). A most prominent feature, to my knowledge observed only once, though I have searched for it in the literature for the past thirty years, consists in a venous capillary hemorrhage from these ulcerations. At times, usually in the defervescing stage, a lamellous epidermic exfoliation would take place, exposing painful surfaces. Kudisch's case[26] resembles mine. It occupied three-quarters of the leg, had a vegetating appearance, bled easily, and had festooned borders. The hemorrhage, however, was not so abundant and there was no such epidermic exfoliation. My patient is not afflicted with hemophilia, has a normal blood-count, no nosebleed, no excessive menstruation and has healthy gums. At first varicose veins were thought of as the cause of this unusual symptom, but they were not found. Microscopic examination of an excised portion, however, revealed very marked dilatation of the blood- and lymph-vessels causing these extensive capillary hemorrhages in the pars papillaris. This finding explained the unusual feature of the lesion, caused by an excessive development of the vascular loops of the papillae, which formed the anatomic basis of the fungating lesion.

Histologic Examination.—By Dr. W. McMurtry of the Pathological Division of the Dermatological Department of the Vanderbilt Clinic.

Epidermis: This shows considerable acanthosis. The interpapillary prolongations are shortened or absent generally. The rete malpighii is slightly edematous in spots and the intercellular spaces contain more than the usual number of leukocytes. In one area only, marked parakeratosis is seen, but elsewhere the stratum granulosum and corneum are approximately normal; the latter shows hyperkeratosis in certain areas although clinically a marked tendency to scaling was seen. Certain rete cells show intracellular edema while others are somewhat swollen and stain faintly.

Derma: The entire derma is markedly thickened. The hyperplasia is due partly to a swelling of the collagen, an increase in the connective-tissue cells, fixed and transitional, and to a very marked dilatation of both blood and lymph-vessels and the presence around both of fairly dense cell infiltrations. The latter consists of some mononuclear and polynuclear leukocytes, a great many lymphocytes and a considerable number of plasma cells. Extensive capillary hemorrhages are noted in the pars papillaris. The walls of the larger blood-vessels show no evidences of degenerative changes. The elastic fibers are seen only in the deeper portion of the derma and appear thickened and broken. In the center of the sections there is an abscess. This has evidently begun as a follicular pustule and has then extended downward in an hour-glass shape. Surrounding it is a perifollicular infiltration of leukocytes, lymphocytes and connective cells with considerable number of red blood-corpuscles. No giant cells and no chorioplaques were found. The sweat and sebaceous glands show periglandular infiltration. No evidence of either syphilis or tuberculosis is seen. Macrophage cells (*Schaumzellen*) as described by Passini[27] were not found.

Figures 2 and 3 show the convex outline of the lower border of the lesions and the centrifugal extension of the process downward. It has not extended beyond this limit in the last two years, but shows some activity, as seen on the upper border. The photograph was taken in February and represents the usual, although at this time slight, winter exacerba-

26. Kudisch: Drei Fälle von Bromoderma Tuber. Veget., Dermat. Ztschr., 1912, p. 703.
27. Passini: Pathology des eruptions bromides, Ann. de Dermatol., 1906, No. 7, p. 1.

tion. At present, in June, there are no ulcerations visible. The leg shows now a reddish-brown, smooth, slightly scaly, atrophic appearance. Its circumference is two inches less than the right one. The skin is tensely drawn and when pinched shows thin-ridged sallow papery folds. The whole process has lasted over three years. Bromids are taken and discontinued occasionally and for a short time. Bacterial cultures were negative, chemical analysis of sections also negative. The urine showed specific gravity of 1.013, traces of albumin, a large excess of indican, subnormal excretion of urea, frequent crystals of calcium oxalate. No bromids were detected after careful search. This finding corresponds with the veracity of the patient with reference to the ingestion of bromids.

DIFFERENTIAL DIAGNOSIS

In the foregoing the confounding of medicinal eruptions with syphilis has been dwelt on as the most serious of possible mistakes. I will try to offer some points on differential diagnosis. The sudden onset and the usual topographic distribution of these eruptions should be constantly kept in mind. Thus, a pustular bromid acne will develop more acutely than a pustular syphilid. It will show a predilection for the head, face, and extremities, while the syphilitic eruption will be found irregularly scattered over the body though it adheres more or less to a symmetrical arrangement. Bromid acne extends down into the cutis and is harder to the touch than the syphilitic or necrotic variety. The absence of inflammation in acne cachecticorum will serve to distinguish it from bromid acne; and from acne vulgaris it can be differentiated by its rapid and simultaneous appearance on the scalp and other hairy parts, by the absence of seborrhea oleosa and comedones and of other concomitant signs of pilosebaceous gland alterations. Finally, bromid eruptions like to develop on scar tissue.

Acne caused by iodin has a more acute onset. Ehrman,[28] however, classes it also with the bromid variety, while Szadeck attributes to the former a more acute beginning. I venture to remark that the affection of the mucous membranes as an almost always present symptom of iodin intoxication, will serve as an useful differential diagnostic sign. It should also be remembered that the iodin eruption shows a tendency to assume a bullous type.

To distinguish it from an exulcerated iododerma is at times very difficult. This develops from the bullous type, rarely observed in bromoderma and is accompanied by a highly inflamed, often erysipelatous, swelling, deeper necrobiosis and more intensive systemic disturbance. Moreover, it does not occupy, as does the bromoderma, the lower extremities by predilection, and does not show the marginal honeycombed smegma-excreting walls. The examination of the urine and anamnesic data will also prove helpful toward a correct diagnosis.

Both the bromoderma and the iododerma offer at times insurmountable difficulties to differentiation from the exulcerated gummous syphilid. Both form ulcers by central breaking down; both show steep walls. The studded pustular points around the margin, the flabby, sluggish feel to the touch of the bromoderma, will vividly contrast with the gyrate serpiginous configuration and convex margin of the ulcerating tuberculosyphiloderm. The Wassermann reaction and, eventually, a provocative salvarsan injection will soon solve the question.

28. Ehrman: In Mracek's Handbuch der Hautkrankheiten, Vienna, 1891, part 3, p. 505.

TREATMENT

The antagonism between the two haloids, bromin and chlorin, one replacing the other and vice versa, has been utilized against bromin intoxication. Bromin retention in the system is due to ineffective kidney excretion. Bromin is absorbed quickly from the intestine, and if not excreted soon by the intestinal tract it rapidly manifests itself in the blood, deplacing its chlorids. It is, therefore, administered in cases of bromin intoxication in epileptics when untoward symptoms require cessation of the bromids. The same holds good in skin eruptions. Theoretically, the application of saline compresses on bromodermas and the ingestion of table-salt would recommend themselves. Ulrich[29] recommends also salt baths for the same reason. Ointments invariably aggravate the condition. In my case rest and a 4 per cent. boric acid solution applied continually and held in place by a soft gauze bandage kept moist, was very effective.

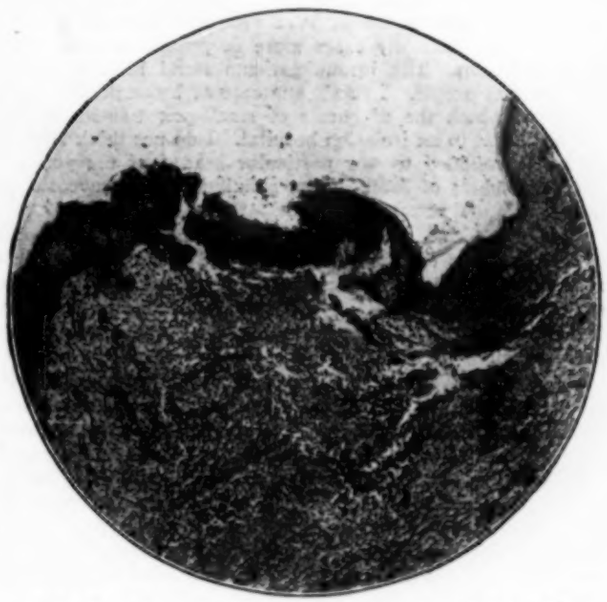

Fig. 5.—Bromoderma. Pustulation, atrophy of epidermis. Hemorrhage and round-cell infiltration.

CONCLUSIONS

1. Drug eruptions may simulate almost any known skin affection.
2. A skin eruption starting suddenly without any prodromal symptoms is almost sure to be a medicinal eruption.
3. The violence of development, the preponderance of the local over the systemic disturbances is characteristic of drug eruptions.
4. The brevity of the acute stage and the quickness of defervescence constitute a notable asset in diagnosis.
5. The usual four stages of the acute contagious exanthems, namely, the prodromal stage, the eruptive, the fully developed and retrogressive and the desquamative stage are wanting.
6. The temperature never rises to the point shown by the acute exanthems and the affection of the mucous membrane is never so severe.

42 West Ninety-First Street.

29. Ulrich: München. med. Wchnschr., 1910, No. 22.

ABSTRACT OF DISCUSSION

DR. ERNEST L. MCEWEN, Chicago: Cases of bromoderma are sometimes found in epileptics in which the skin eruption closely simulates blastomycosis. I recently saw a bromoderma in a girl of 16, an epileptic, who for a long time had been taking large doses of bromids. The lesion in this case appeared suddenly and extended rapidly, totally unlike what we see in true blastomycosis. Dr. Oliver S. Ormsby of Chicago, reported a similar case some years ago, in which the lesion spread with astonishing rapidity and closely simulated blastomycosis.

DR. A. RAVOGLI, Cincinnati: Not long ago I saw a child with massive tumors on the face and head. The child had been treated with the Roentgen rays and was getting worse and the treatment had also set up a Roentgen dermatitis. On inquiry, it was learned that the child had been taking bromids, and when this was discontinued, the lesions healed under simple treatment. I have also seen an acneiform eruption on the legs, due to bromid which was very difficult to diagnose.

DR. M. L. RAVITCH, Louisville: I do not agree with Dr. Weiss that these cases are so very unusual; I think many cases of bromodermas have been reported in the literature, and I have seen many cases more in private practice than in the asylums. The insane patients stand bromids better than normal people. I recall one case of bromoderma in an infant in which the diagnosis of small-pox was made and the child sent to an isolation hospital. I do not think bromoderma is confined to any particular season of the year. I have seen cases of bromoderma simulating blastomycosis, in winter, fall and summer.

DR. GEORGE M. MACKEE, New York: I had the opportunity of studying this case very carefully, and it offered considerable difficulty in the diagnosis. Among other things, we considered tuberculosis, syphilis and blastomycosis, and finally arrived at the correct diagnosis by the process of elimination.

DR. LUDWIG WEISS, New York: Bromoderma is not a very rare condition, but in my case there were some unusual features. The hemorrhages from the vegetations were at times very profuse, owing to the dilated venous loops in the papillary layer. I mentioned the seasonal occurrence of bromoderma only as a curiosity. We find that erythema nodosum and other forms of erythema are worse in cold weather and improve in the summer. As Dr. MacKee has already pointed out, the lesions in this case had to be and were differentiated from a syphilid, pemphigus and other forms of eruption.

FAVUS AND RINGWORM OF THE NAILS

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Favus and ringworm of the nails are supposed to be rather rare conditions. The finding of 101 such cases among the aliens arriving at Ellis Island during the first eight months of the present fiscal year goes to show that these disorders are probably more common, at least among our foreign population, than is generally believed.

Clinically both diseases present practically the same symptoms. The affected nail is thickened, brittle and sometimes even caseous. The natural color and transparency of the involved portion is lost and it becomes opaque and yellow or dirty-white in appearance. The process generally starts at the distal end and slowly infiltrates the nail toward the base, the diseased portion crumbling away gradually, because of the trauma to which the part is necessarily exposed in the ordinary vocations of life (Figs. 1, 2, 3, 4 and 5).

The side or base of the nail, however, may occasionally be first involved. Rarely the whole nail appears to be simultaneously attacked, and there is a more or less universal involvement of the whole horny substance. If the nail does not flake and break away, leaving a rough, uneven, diseased surface, it is very

Fig. 1.—Ringworm of nails.

much thickened and deformed. Only one nail may be involved, or several or all. The thumb, index-finger and middle fingers are the ones most commonly attacked, and as the nails are generally infected from

Fig. 2.—Favus of the nails.

scratching the scalp, this distribution would be expected.

The disease does not appear to be painful nor does it seem, at least in our experience, to predispose toward setting up any acute inflammatory conditions of the surrounding soft parts.

PROGNOSIS

The process is essentially chronic, and if untreated continues indefinitely. The youngest patient whom we have encountered was 3 years old, the oldest 72. Reliable histories were hard to obtain, but one unfortunate asserted that this condition had been present for fifty-two years.

DIAGNOSIS

While the mottled, yellow, thickened and crumbly condition of the nails affected is highly characteristic, there are other conditions, besides an infiltration of these specific fungi, which resemble it very closely. These are syphilis, psoriasis, eczema, simple atrophy and hypertrophy, grave constitutional disorders, and some other skin diseases (Figs. 6, 7, 8, 9 and 10).

When the nails are affected by some general constitutional process, it is usual to find all of them involved. In ringworm and favus one or more often escape. Hypertrophic and atrophic conditions of the nails likewise involve all of them and the entire nail substance.

Fortunately it is not necessary to endeavor to find clinical points of difference, as a microscopic examination enables us to make the diagnosis with certainty.

Fig. 3.—Ringworm of the nails enlarged, showing peculiar deformity.

Fig. 4.—Favus showing crumbling of the nails. This case was of four years' duration.

Fig. 5.—Ringworm of nails showing general yellow infiltration but no loss of substance.

METHOD OF EXAMINATION

Several drops of a 20 per cent. solution of potassium hydroxid in water are placed on a slide and a few fine scrapings from the suspected areas dropped in the solution. The slide is moderately heated once or twice and allowed to stand a few minutes. In a little time the suspected material becomes increased in size and soft in consistency. The "clearing-up" process may be hastened by gently separating and dividing the specimen with an ordinary teasing-needle. Several of the smaller bits of the softened scrapings are then placed on another slide and a drop of the solution of potassium hydroxid added and a coverslip placed over all. The slip is gently pressed down so as to make a fairly thin preparation.

Examined with a 4 eye-piece and a 7 objective with subdued light, the fungi appear as highly refractive, slightly greenish, transparent, branching threads among the partly disintegrated elements of the nail. If properly applied the potassium hydroxid solution clears up and partially dissolves the normal nail material, leaving the fungi standing out distinctly in the field (Figs. 11, 12, 13 and 14).

If the clearing-up process is too slow, reheating will materially hasten it. A little search may be

Fig. 6.—Simple hypertrophy of nails, end view, natural size. The patient, an alien, asserted that the condition had existed from birth.

Fig. 7.—Simple atrophy of nails, asserted to exist from birth.

Fig. 8.—Atrophic condition of nails due to severe burn received during childhood.

necessary to find them, but in many specimens every field will be found to contain a number of the threads. Generally the organism of both favus and ringworm when obtained from the nails appears as plain, hyaline, branching threads which here and there show faintly the separation into spores or which contain at more or less regular intervals a small, round, highly refractive spore. Occasionally, as in the illustrations, the spore formation is very prominent; but such a distinct separation into spores is not the rule.

INVOLVEMENT OF THE SKIN OF THE PALMS AND FINGERS

In a number of these cases I have noted that the skin of the palm and palmar surface of the fingers was unusually hard, horny, calloused, and had a tendency to crack and peel off in flakes. While this condition is generally observed to a moderate degree in laborers

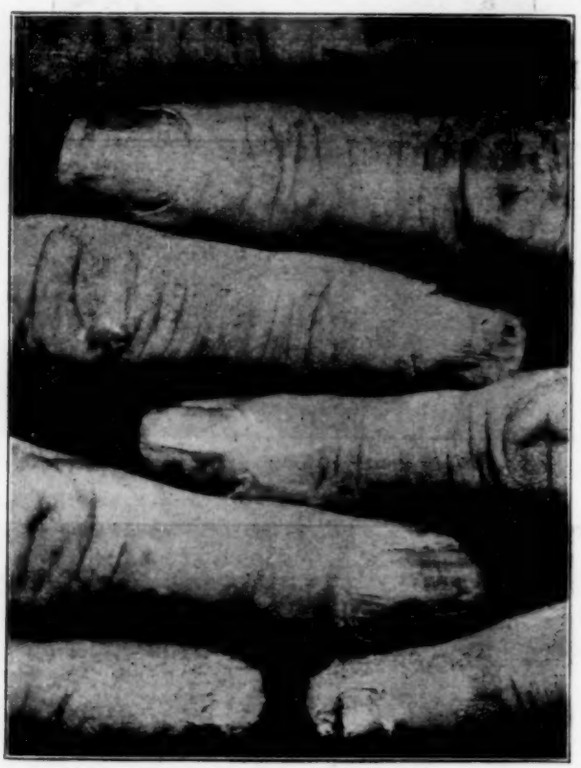

Fig. 9.—Syphilis of the nails. The palm of this case is shown in Figure 17.

who use the pick and shovel constantly as a means of livelihood, yet it is unusual to see it to the extent present in many of these nail cases. We have lately been examining scrapings from these hands and have found the organism to be generally present in the skin, presenting practically the same appearance as in the nails.

While ringworm and favus of course frequently attack the glabrous skin, the clinical symptoms when involving the thickened horny epiderm of the palm and fingers is so different that there is no similarity to ringworm elsewhere (Figs. 15, 16 and 17).

The lesions are not red or circular, but merely what would ordinarily be considered as an extreme degree of callosity with a marked tendency to peeling, and it would appear that the disease in this location has been frequently overlooked, as I have found no description of this condition in the literature on the subject to which I have access.

DIAGNOSIS OF FAVUS FROM RINGWORM

As stated above, both disorders present clinically practically the same symptoms, and the fungi of ringworm and favus when obtained from the nails resemble each other so closely when examined microscopically that a separation of the two diseases on these findings alone is generally impracticable. If there be favus of the scalp or elsewhere on the body, or if the scalp bear the scars of old favus, it is proper to assume that the condition of the nails is also due to the same organism. Similarly if other parts are involved with ringworm, it is likely that this is also the cause of the onychomycosis. If neither active favus nor ringworm is present elsewhere, and there is no evidence of old favus, it is customary to make a diagnosis of ringworm, as ringworm of the scalp often disappears spontaneously after puberty and leaves no scars, and it is likely that the disease was transferred to the nails when it was active in the scalp.

Fig. 10.—Idiopathic loss and destruction of two nails. Case was kept under observation for a number of weeks and repeated examinations made, but no cause for the condition could be discovered.

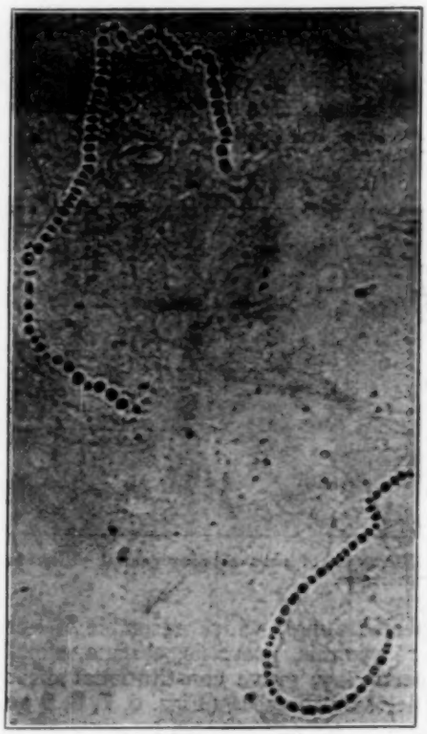

Fig. 11.—Photomicrograph of the organism of ringworm, × 330. It is unusual to see such marked spore formation.

COMPARATIVE FREQUENCY OF THE TWO DISEASES

In our series of 101 cases eighty-four were ringworm and seventeen favus. This would indicate that ringworm is encountered about five times as often as favus. It may also be interesting to know that these 101 cases were discovered among 521,366 aliens who were examined. Roughly speaking, the ratio of cases was about one to five thousand of these foreigners.

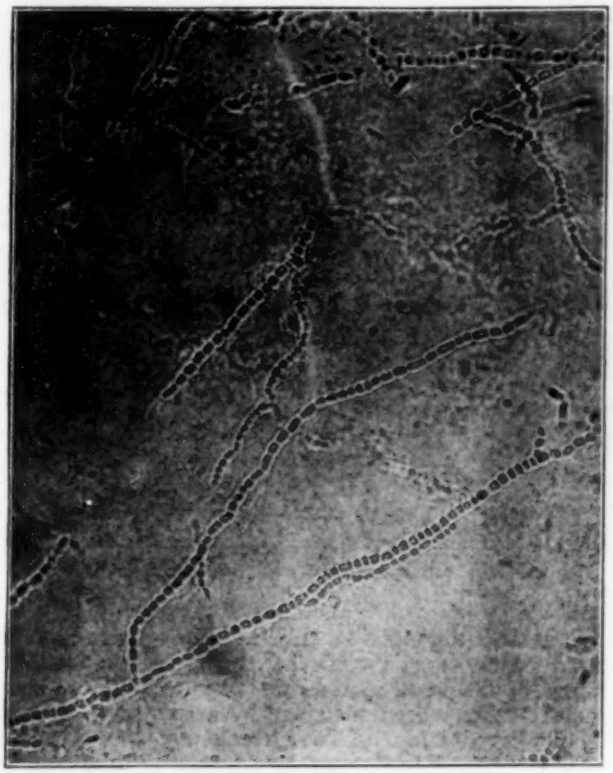

Fig. 12.—Photomicrograph of the organism of ringworm, × 330. It is unusual to see such marked spore formation.

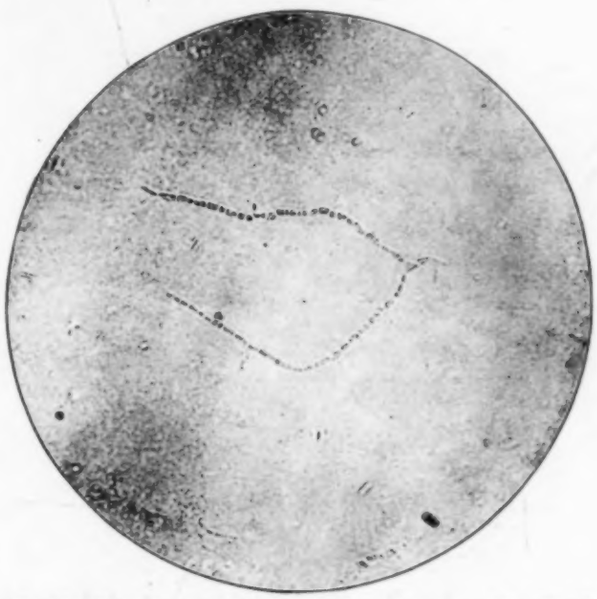

Fig. 13.—Photomicrograph of the organism of favus, × 330. Usually the spores are not so distinct. From the case shown in Figure 4.

TREATMENT

All authorities agree that the onychomycoses are extremely stubborn and resistive to all forms of treatment, and from the pathology of the disorder we would expect this to be the case.

The organism grows into the nail substance and down into the matrix, where it cannot be reached by any local applications. Any form of treatment must be preceded by curetting and scraping away the diseased part of the nail so as to apply the antiseptic to the denuded surface. Continuous application of the desired remedy may be obtained by pulling rubber finger-cots over the infected fingers and placing the medicine inside of them. Care must be taken to avoid setting up a general inflammation of the part by too severe or too prolonged treatment.

Stelwagon recommends dipping the finger-ends in a solution of mercuric chlorid, from 1 to 3 grains to

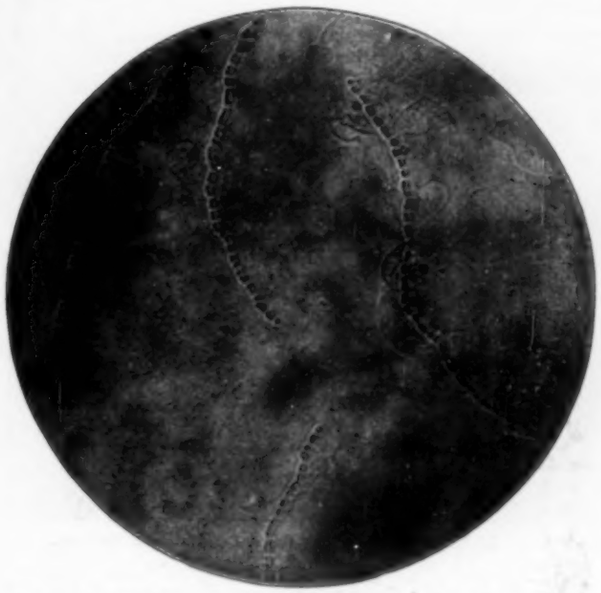

Fig. 14.—Photomicrograph of the organism of favus, × 330. Usually the spores are not so distinct. From the case shown in Figure 4.

Fig. 15.—Ringworm of the palm. The nails also were involved.

the ounce, for from five to ten minutes daily, allowing it to dry in and then enveloping the parts with an ointment of white precipitate or calomel, a dram to the ounce. He also recommends the use of a 20 per cent. solution of sodium thiosulphate, subsequently followed

Fig. 16.—Favus of the palm; the nails also were involved.

by enveloping the fingers with an ointment of precipitated sulphur, 1 dram to the ounce. He also speaks of Harrison's treatment, which consists in applying a 6 per cent. solution of potassium iodid in equal parts of 20 per cent. solution of potassium hydroxid and spirits of wine for three or four minutes at a time. This is done two or three times at intervals of two or three days, and then Solution 2 is applied. This solution consists of 4 grains of mercuric chlorid dissolved in 4 drams each of spirits of wine and water. It is asserted that by this process mercuric

Fig. 17.—Syphilis of the palm, which clinically resembles favus.

iodid is formed deep in the tissues. Tincture of iodin and a host of other germicides have been recommended.

My experience with these remedies on the nails is too limited to justify my expressing an opinion concerning their utility. Concerning ringworm of the scalp, I am in a position to say that all medical applications in my hands have been extremely disappointing. We have the records of a family of three children aged, respectively, 6, 8 and 11 years, who were treated most persistently in two hospitals for two years by several skilful men, one of them an eminent New York specialist. They were then treated as outpatients in another hospital for six months. At the expiration of this two years and six months' treatment, a microscopic examination showed the organism in all of them and they were apparently no nearer a cure after all this prolonged medication than at the beginning.

Fig. 18.—Wiry hair and scarred scalp following favus in a young adult.

I am of the opinion that some of the reported rapid cures of ringworm of the scalp were either errors of diagnosis in the first place or that the cure could not have been sustained by a competent microscopic examination. I have frequently seen patients in whom the clinical symptoms promptly disappeared

Fig. 19.—Old favus of the scalp and active favus of the nails. Cause and effect.

in a few months on the application of the ordinary remedies, but in whom a microscopic examination revealed plenty of hairs infested with the spores of ringworm.

Much more encouraging reports are made from the use of the Roentgen ray, but as it has no direct action on the organism and acts simply by producing epilation (Sequeira), it would not appear to be applicable in combating the condition in the nails.

In view of the tediousness and uncertainty of medical treatment, the avulsion of the nail and the application of some germicide to the matrix may be justifiable. We have adopted this procedure in two cases.

PROPHYLAXIS

When the hands and nails are involved by either of these fungi, the likelihood of their transmission to others is probably much greater than in cases of the same disorder occurring in the scalp. The sufferer is constantly scattering far and wide particles of disintegrated nail substance and flakes of skin which are loaded with the organism. His hands are continually in contact with objects of common use and very often directly with the persons of others. More ideal conditions for disseminating the infection could scarcely be devised. Imagine the situation should a barber or hair-dresser contract the disease in the nails and continue to practice his vocation!

Fig. 20.—Old favus, recovered, of the scalp, in man aged 28. Note the loss of hair and the coarse, wiry appearance of the hair present.

Favus of the scalp or nails is a severe and loathsome disease. Unless energetically and carefully treated from the start for a very long period, it always results in permanent loss of the hair and scarring of the scalp in the areas involved with great disfigurement (Figs. 19 and 20).

Fortunately the disease is rather infrequent in America and our strict immigration inspection prevents new cases from being introduced from those foreign countries in which it is prevalent.

In view of the danger to the community at large, it would seem that favus should be added to the list of notifiable diseases and that cases occurring in this country should be placed under such restraint by the local health authorities as may be necessary to prevent the spread of the disease to others.

My thanks are due to Surgeon L. L. Williams of the U. S. Public Health Service for his kindness in permitting me to refer to these cases. I desire also to make my acknowledgments to Assistant Surgeon J. H. Smith, who has done the microscopic work, and to Pharmacist Charles Slough who has given valuable assistance in making the negatives.

Ellis Island.

A COURSE IN SURGICAL TECHNIC*

WILLIAM COGSWELL CLARKE, M.D.
AND
FREDERIC W. BANCROFT, M.D.
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The course in surgical technic here described was designed to meet a demand in the surgical training given in Columbia University. It is realized that familiarity, by actual observations on animals, with the use of aseptic materials, the appearance and manipulation of living tissues, the control of hemorrhage, and the methods employed to prevent contamination and subsequent infection of recent wounds, is an equal advantage to the graduate whether he enters practice immediately on graduation or prepares himself further by a hospital training. The opportunity to participate in operating-room routine, such as the preparation of the patient, the surgeon, the instruments and materials, is now of recognized value, and this recognition has created a need for special training in the details of aseptic surgical technic.

The course is given to fourth-year medical students in the Laboratory of Surgical Research, where there is a well-equipped animal hospital. In order to provide an opportunity to educate recent hospital graduates in teaching methods as well as to instruct the students, the teaching staff has been made unusually large. It includes twelve instructors in surgical technic and two in surgical pathology, all of whom have had surgical service in a hospital.

Four of these instructors are on duty at the same time. Each instructor serves for three months, but, by a scheme of rotation, he acts as assistant instructor during the first two, supervising the students at one table where he fills the place of second assistant, while during the third month he is instructor in chief and attending surgeon at the University Animal Hospital, where he makes a daily visit. The schedule is so arranged that each instructor becomes the chief twice in a period of twenty-four scholastic months.

The course is an optional one, but so great is the interest it has aroused that at least three-fourths of the fourth-year students elect it, and each of the sections into which the class is divided contains ten men on an average. Each section receives instruction for eight periods of two hours each. It is divided into groups of three men, so that an average section furnishes operating staffs for three tables, and the men at each table rotate at successive lessons in the position of anesthetist, first assistant and operator.

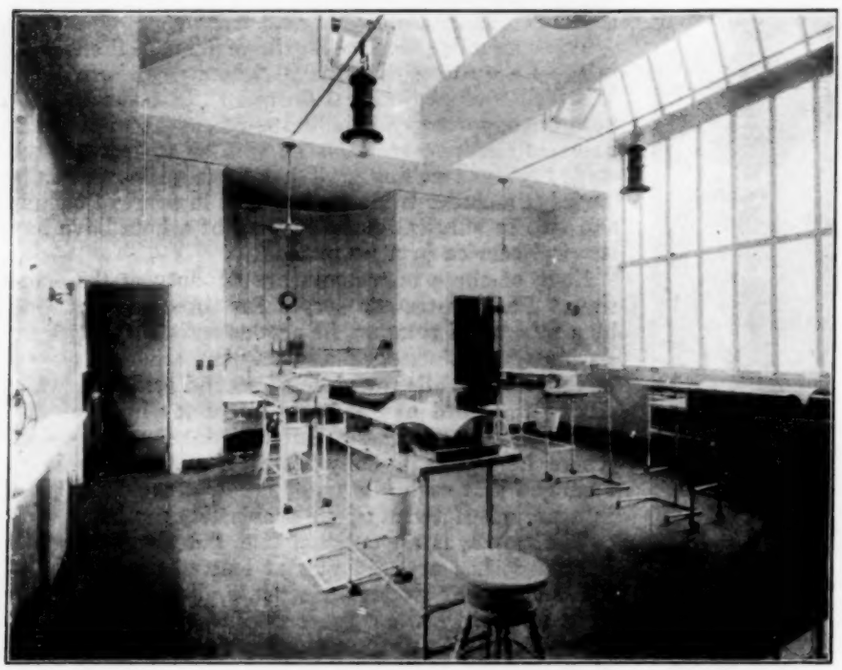
The nurse in charge is a graduate of a hospital training-school. She is familiar with all surgical requirements and has supervision over the animal hospital and operating-room, under the direction of the attending surgeon on duty. At its initial lesson she instructs each section in the preparation of surgical supplies and their sterilization, the care of instruments and utensils, and in the manipulation of sterile gowns, gloves, etc. She also prepares for the operative sessions exactly as in the operating pavilion of any first-class hospital.

The operating-room is furnished and equipped on modern lines. It is 20 feet square, lighted by sidelights and skylights, and provided with powerful arc-lights. Adjacent rooms are used for sterilizing, anes-

* From the Department of Surgery, College of Physicians and Surgeons of Columbia University, New York.

thesia and private operations, and there is a detached room for necropsies. The sterilizing plant includes an autoclave, instrument boiler, utensil boiler and water sterilizers of the latest type.

The animal hospital has been fitted up with every regard for the animals' comfort. Each animal has a separate cage, and there are especially heated ones for recovery from anesthesia. The entire time and attention of one man is given to these animal patients. The animals themselves, as well as their surroundings, are kept scrupulously clean with the aid of a bath-tub, sluicing-hose, proper disinfectants and abundant light and ventilation. As the hospital is maintained to treat animals with surgical lesions, many dogs suffering from tumors, infections and prolapsus uteri have been received as private patients. Thus the students under direction of the attending surgeon have had the opportunity of assisting at operations on real pathologic conditions. In his daily visits the attending surgeon inspects all the animals and gives such directions for their care as may be necessary to the nurse in charge and her assistant. Daily notes of temperature and general condition are entered on each patient's chart for the information of the surgeon and the students.



Operating-room for the class in surgical technic, Department of Surgery, Columbia University.

In order to preserve uniformity of instruction, the professor of surgery has prescribed a definite series of demonstrations and operations for the course. A printed outline of these is furnished to every student at his first lesson.

First Session: The course opens with a lecture and demonstration on (*a*) suture materials and instruments; (*b*) preparation and sterilization of surgical supplies; (*c*) the administration of anesthetics to animals; (*d*) the preparation of the animal for operation; (*e*) the sterilization of the surgeon's hands, and relative values of different methods in use, and (*f*) prescribed method of putting on cap, mask, gown and gloves.

Second Session: The abdominal incision and its repair in layers. Repair of wounds in the intestine. Enterotomy performed, and intestinal suture illustrated. Technic of applying dressings.

Third Session: Lateral entero-enterostomy.

Fourth Session: Posterior gastro-enterostomy.

Fifth Session: End-to-end entero-enterostomy, by suture.

Sixth Session: Exploratory laparotomy, for a stab-wound of the abdomen, inflicted under anesthesia. The location and repair of the lesions are demonstrated.

Seventh Session: Nephrectomy, illustrating the treatment of the pedicle.

Eighth Session: Repetition by each table of any operation which has been unsuccessful.

The routine of a session is as follows: The chief instructor outlines briefly, at the beginning of the lesson, the steps of the operation to be performed, illustrating them by diagrams on the blackboard. He then assigns the students to their duties, and the usual routine of an operating-room begins. The anesthetist starts the anesthesia in the etherizing-room, the animal is placed on the operating-table and the field prepared by the first assistant (the hair has been removed and the animal given a full bath on the day before by the attendant). The skin is prepared by scrubbing with green soap and water, then with alcohol 70 per cent., and rinsing with mercuric chlorid 1 :10,000. The table is then wheeled into the operating-room and draped with sterile sheets by the operator, who has previously scrubbed up and has put on cap, mask, gown and gloves, under the supervision of his instructor.

During the operation the instructor at each table directs every step and calls particular attention to the observation of asepsis, handling of instruments, placing of sutures, control of hemorrhage and the importance of handling living tissues with gentleness. Before leaving the room the student operator writes a description of his procedure on the history sheet of the chart, which is to hang by the animal's cage.

At the conclusion of the operation, every step of which has been done under full anesthesia in every case, suitable dressings are applied to the wound and the animal is carried to the hospital and placed in a "warming cage," in order that chill may be prevented and the animal made comfortable. The animal receives special attention during convalescence, its temperature and general condition are noted daily on the chart, and the diet is carefully regulated by the attending surgeon. The student-operator is urged to visit his convalescent patient and to consider the outcome of his procedure of importance equal to that of the operative result on a human being.

At the beginning of each operative session, necropsies are performed by one of the instructors in surgical pathology on any animals which have died as a result of operation. A few, selected from the convalescents, are chloroformed and necropsied for the purpose of showing the students the contrast between the normal repair at various intervals after operation, and

the pathologic conditions produced when an operation has been unsuccessful. Attention is drawn to the resistance of the healing wound to tension, in both abdominal and intestinal walls, to the constant formation of peritoneal adhesions, and to the benefit or harm which may result from the attachment of the great omentum to the various viscera. Preceding a necropsy on a pathologic animal, the student who operated on it is questioned as to his procedure, and as to any postoperative symptoms which might indicate the cause of death. He is also questioned regarding the treatment he would pursue with a human patient who exhibited similar signs and symptoms, and is asked to give his reasons therefor. Thus a constant effort is made to keep clear in the minds of the students the clinical aspects of the case, and the importance of necropsies is emphasized, as a means of correlating them with the various pathologic conditions and processes that are found to exist. This practice is intended as an aid to the interpretation of physical signs and to the understanding of the principles of treatment in human surgery.

Specimens of tissues are selected at the necropsies, and microscopic sections are made to show the students the cellular morphology of all common postoperative conditions, including wounds healing by first intention, infected wounds, and the various types of peritonitis, with or without adhesions. At the close of each necropsy, the student-operator is required to write a complete report of the pathologic findings, and these reports are bound with the histories. To increase the interest of the students, a comparative record of the results of each section's work is kept, which proves a stimulus to both students and instructors.

The routine performance of necropsies has brought out many interesting surgical facts which should be of lasting benefit to the students. Peritonitis occurred most frequently after the operation of end-to-end intestinal anastomosis. In the cases of gastro-enterostomy the most frequent cause of death was pneumonia, suggesting the increased percentage of pneumonia due to surgical interference in the upper abdominal cavity. To indicate the value of pathologic material that may occur during the year and the benefits that may be derived from the study of such material, a few of the unusual causes of death occurring with the various operations are briefly mentioned here:

1. *Gastro-Enterostomy.*—One case of enormously distended stomach with contracted intestines, due to a small band with a valve-like action, causing obstruction to the entrance to the jejunum. One case of death due to inanition caused by anastomosis of the stomach to the descending colon; here sufficient care had not been taken to identify the loop of intestine used for the anastomosis.

2. *Enterorrhaphy.*—One case of gangrene of the intestine in which the intestinal clamps had been too tightly applied.

3. *End-to-End Entero-Enterostomy.*—One case of cirrhosis of the liver with ascites; death was due to oozing. One case of infection of the abdominal wound, followed by protrusion of the omentum with beginning gangrene.

4. *Exploratory Laparotomy for Stab-Wound.*—One case of general peritonitis, due to an overlooked stab-wound in the intestine. One case of thrombosis of the superior mesenteric vein, with gangrene of the small intestine. This was probably due to excessive traction on the mesentery, as no other cause could be found. One case of general peritonitis due to a gauze sponge that had been left in the abdominal cavity.

The sections that saw these last three necropsies learned a lesson in surgery which they will probably never forget, so clearly was brought out the necessity for careful handling of the tissues, and for keen systematic observation.

Intussusception was found to be a frequent cause of death, and has apparently no relation to the type of operation performed. It is probably due to the handling of the intestine. Both cross-sections and longitudinal sections have been made to show the students the relations of the layers of intestine and constriction of the mesentery in such conditions.

The private animal patients admitted to the hospital have been the means of demonstrating several neoplasms as well as other instructive conditions. One student section had the opportunity of operating on congenital oblique inguinal hernia occurring in three youthful pigs, all from the same litter. The students had the subsequent satisfaction of having these three animals returned home, discharged cured, and the wounds healed by first intention.

The advantages of a course of this kind are numerous. The existence of a staff of instructors, each occupying in turn the position of chief, not only makes each instructor's service short enough to maintain constant enthusiasm, but also acts as a stimulus, because of the element of competition. Each surgeon has an opportunity to observe the teaching methods of his associates, and to note their merits or defects, with a view to increasing his own efficiency. The combination in a single course of the technic of operative procedure with the pathologic findings in the cases in which operation has been performed leads the student, when brought into contact with clinical cases, to reason in terms of pathologic processes and conditions. This assists him to correlate his knowledge of anatomy, pathology, bacteriology and physiology with surgery. He is trained to base his conclusions on observations of facts rather than on dogmas.

Finally, after such a course the student has become acquainted with the technic of asepsis, the use of surgical instruments and the other essentials of general surgical procedure; he has learned that an operation must be conducted exactly and methodically, and he has felt a personal responsibility for its success or failure.

When, therefore, he enters practice and is confronted with the necessity of operating, he is no longer an untried apprentice. Already familiar with the fundamental principles of aseptic surgical work, he is enabled to avoid many a costly mistake, and is far better fitted to do credit to himself and justice to his human patients.

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The Logical Starting-Point.—The diseases common to child life are spread by the mingling of the sick with those who are well. The public schools are the places where the children of all ages and degree assemble. It follows then that the public school is the logical point at which to begin the important work of controlling those diseases that are spread as has been stated, by the mingling of the sick with the well.—*Bull. Chicago School Sanit. Instr.*

THE MEDICAL SCHOOL AND THE STATE*

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The layman who ventures to speak concerning a matter so technical in some respects as medical education owes perhaps an explanation to the public and to the medical practitioners. What can the layman say as to the training of medical experts which is of value or which the public cares to hear?

There are three main reasons why the layman has a right to be heard in the matter. First of all, medical education is primarily a matter of education, not a matter of medicine. The educational test which shall be imposed, the premedical education itself, the educational methods of the medical school, are all matters not of medicine but of education.

Secondly, the layman who gives thought to these matters has a right to speak from the point of view of his own interest for it is the layman after all who is to be either made or marred by the medical practitioner. The general public is profoundly interested in the question whether the medical expert has been rightly trained for his profession.

In the third place, the layman is necessarily interested in the medical school as a matter of state administration. The legal conditions which are finally to be imposed on medical education may originate with medical practitioners, but they will be passed on and finally put in form by legislators. The matter of the public health will be in the keeping of skilled physicians, but the form of administration under which they will work and the relations of the different parts of this organization will be decided by laymen.

To put the whole matter tersely, the practice of medicine is a quasi public profession. The laws which admit to its practice must be framed by those who are not members of the profession, but who are looking at it from the point of view of the public good. Medicine will never gain its rightful place until the intelligent laymen, the legislator, the citizen, realize the public nature of the profession of medicine and their own obligations as to its support, its standards and its regulation.

It is this last relationship, namely, the relation of the state to medicine and to medical teaching, which we need at this time most clearly to develop. We need to distinguish between the opportunity of the individual on the one side and the obligation of the state on the other.

The public health of the inhabitants of a state is without doubt the largest single interest with which a state needs to concern itself. Expressed even in commercial terms it exceeds all others. Disease, ill-health, insanitary public conditions, cost more than any other form of public neglect. The conservation of the public health is therefore the largest interest to which the state must give its attention.

Our American commonwealths have begun only within a very few years to be conscious of this problem. In a few states steps have been taken to deal with the problem in orderly and efficient form. It therefore seems worth while on such an occasion as this to lay special emphasis on this public duty; to call attention to the fact that the medical school and the hospital ought to form the very heart of those agencies by which the state undertakes to deal with the public health and that there must be worked out a form of administration under which the state shall coordinate all its agencies, the board of health, the medical school, the hospital, the laboratory, for an efficient handling of the problem of the public health.

The present demand for an effective organization of public health agencies arises out of the progress of what we call to-day scientific medicine as compared with what twenty-five years ago was empirical or sectarian medicine.

Following the great discoveries of the chemists, the biologists, the bacteriologists, all sectarian divisions of medicine became meaningless. Men came to realize that medicine is applied science and that it should rest like all other technical and scientific practice on the results of experimental knowledge. It avails itself of whatsoever could be shown by careful experiment to be true in the practice of any medical body. It subjects every appliance to the scientific test, and while this process wiped out all distinctions of caste it set up as a condition for entering the profession the possession of the inquiring, active, critical, scientific spirit. Sects in medicine are no more possible under this conception than in botany or astronomy. Deliberately to label oneself an allopath or a homeopath or an eclectic is to return to a past epoch of medical history.

One of the first results of this change of attitude in the profession in its relation to laymen lay in the willingness of the practitioner to admit the limitations of his knowledge. The student of scientific medicine no longer hesitates to say he does not know; he does not pretend to universal knowledge; but he has possession of methods which ultimately will lead to the solution of most if not all of our problems. Scientific medicine does not pretend to say that the solution of all these has now been attained.

Another significant result of the introduction of the scientific method and its universal activities lies in the fact that the emphasis on preventive medicine becomes greater. Modern medicine realizes that it is not enough to cure those already ill; it is not enough to build hospitals for the sick; it is not enough for the surgeon to relieve the pain of those actually suffering. All this is a part of the work of modern medicine, but a still greater part lies in the prevention of illness, in creating conditions favorable for health, in so dealing with the problem of the public health that there shall be a minimum of disease, a minimum of ill health, a minimum of suffering. It is the rise of preventive medicine, based on the science of chemistry, biology and physics, which has brought home to the state the realization of its own supreme duty in safeguarding the physical well-being of all its people. The state has long accepted the problem of caring for the helpless sick. To-day it faces the duty of preventing the helpless from falling into unnecessary illness.

The working out of this problem means not only the betterment of sanitary conditions, not simply the provision against infection and the stamping out of nuisances, but it means more than all else the education of the whole people of a state to the knowledge of the elementary sanitation laws. This education of the people lies at the very base of preventive medicine, and preventive medicine lies at the base of the state's ability to safeguard the public health.

The rise of preventive medicine and the enlargement of the state's function in the conservation of the public health is rapidly bringing about a change of attitude in our whole social and economic treatment

* Address delivered at the dedication of the Robert W. Long Hospital of Indiana University at Indianapolis, June 15, 1914.

of disease and ill health. In the past the care of the sick poor has been a matter of charity; the obligations of society no less than the ideals of Christian service have urged civilized men to continual effort for those suffering from illness who are in want of the necessities of life. This obligation and this service will not cease, but the vista which preventive medicine opens up enables us to anticipate a time when a large share of the suffering and disease which now falls to the lot of the poor will be prevented when the conditions of living will be more wholesome, when the need of charitable service will be limited to those cases which no preventive measures can safeguard. The entrance of the state into the great work of health preservation, while it will not be a substitute for private philanthropy, will nevertheless relieve much of the suffering to which private philanthropy has hitherto ministered, and it ought to diminish in an ever-increasing measure the suffering and the misery of poor and rich alike. This is one field of human endeavor in which an ounce of prevention is worth many pounds of cure.

If one looks forward a decade into the future along the lines which modern scientific medicine opens up, and if he admits that the state must shoulder the responsibility for a uniform and effective system of public health administration, it is clear that the state can accomplish this enormous service, that it can conserve the great interest of the public health effectively, only by some harmonious coordination of its various agencies. To-day the problem of the public health is dealt with by a number of agencies, oftentimes unrelated and disassociated. On the part of the state itself stands an official board of health with similar boards representing communities and cities. The medical school, the hospital and the laboratory are the natural agencies through which any administrative board of health must carry out its measures. Finally, the practitioners themselves must stand in some relation to the state's health activities. Some method must be worked out by which the profession of medicine, quasipublic as it is, shall find a relationship to the state and to the state's work in the matter of the public health which shall be more definite and more satisfactory both to the public and to practitioners than the present arrangement. To state the matter a little more definitely, if the state is to enter on a constructive program in the matter of the public health, if the general public through the state is to reap the benefits of a wise system of preventive medicine, an organization capable of dealing with the problem must be devised, and that organization must be elastic enough to include the board of health, the medical school, the hospital, the laboratory and the practitioner.

What form of organization will suffice for this fundamental public work? That question is the practical one which is to-day being attempted by many American states.

To accomplish the end sought there is needed not so much a hard-and-fast organization as intelligent cooperation between those which have been created. Thus a state board or commission with its executive officers will doubtless continue to be the organization through which the state authority will be exerted. The medical school with its hospital and laboratory will continue to be under the control of the university. Experience has shown that whatever be the weakness of the university, it has been the only agency through which the spirit of scientific inquiry and devotion has flourished. Only in a university have scientific ideals had their fair chance to get into the practice.

What is needed, therefore, is the closest correlation between the state board of health and the university school of medicine. In the state of Indiana it is fortunate that all these agencies are under state control. This simplifies enormously the problem of working out a right coordination. However important and far-reaching are the powers of a state board of public health, the medical school will always remain the heart of the public health activities for the reason that in the medical school practitioner and student meet. The enthusiasm of the teacher and of the investigator give a spirit to the public health effort which no other combination can give. Here as nowhere else the laboratory of the chemist and of the biologist and of the pathologist are brought face to face with the problems of disease in the hospital. Of all human efforts, of all human organizations as yet devised, no other has brought together the same qualities of skill, of devotion, of enthusiasm, as that which comes from the association of student and teacher, of experimenter and practitioner. The medical school with its teachers, its students, its laboratories, its hospital, will be both the inspiration and the hands of the public health service. Fortunate it is for this state that it already controls and is developing a modern school of medicine, imbued with the spirit of scientific medicine, in touch with the research spirit of the day, and ready to develop into the most fruitful agency for the solution of the problems of the public health which this commonwealth must face. It is because I regard the medical school, and when I speak of the medical school I mean to include faculty and students, laboratories and hospital, it is because I regard the medical school and its proper development, its cooperation with the board of health, as the greatest step in the public health service that I venture to spend the remaining few minutes of my talk in a consideration of certain conditions which from the point of view of the educator make for the right growth of the medical school and therefore of the state service.

If the medical school is to be the right hand of the board of health, it must not only cooperate by the training of medical students, by the use of its laboratories for tests and examinations and by the study of disease in its hospital, but it must also take the broadest possible conception of its duties in the matter of education.

There are two fields of medical education which are generally overlooked and which the state school of medicine must vigorously undertake—one is the education of the public in the elementary knowledge of sanitary matters, the other is the education of the present generation of practitioners into an appreciation of the modern conception of the profession of medicine. I venture to spend a few words on each of these topics.

The education of the public into a practical knowledge of the elements of the science necessary for the conservation of the public health is still in its infancy. It has not yet been successfully undertaken by any school of medicine for its own state. By lectures, through the daily press (which has always been a cordial ally in such an endeavor) in all the ways by which a democracy can be educated, the people of a state must be taught the elementary science which prevents disease, cuts down the death-rate of infants, prevents the spread of infection, brings the appreciation of fresh

air and cleanliness to every citizen. Only in a very limited degree does the average intelligent man appreciate how much of the disease and suffering in his community is due to his own neglect. Finally, such a campaign of education must do something to teach the average citizen to use ordinary care in the selection of a medical adviser. It must teach him to discriminate between the graduate of a commercial medical factory and the graduate of a school whose ideals represent the highest step in our civilization, for there is no ideal of human service more creditable to our progress in civilization than that which is set before the student of medicine in our better schools.

There remains still an unfulfilled duty to the men now in the practice. Ill-trained and unfit as many of them are, they represent in a large majority of cases the victims of a condition. Few men deliberately choose a defective and impossible medical training. Well-meaning young men by the thousand have gone into such schools in the honest belief that they were to receive a fitting preparation for the profession of medicine. The victim of the commercial medical school usually finds out his mistake after he gets into practice. If he has the right spirit he seeks by every possible means to repair his defects. To such men the state school of medicine should offer a most hospitable opportunity.

The postgraduate school of medicine as it has hitherto been conducted has generally grown up apart from the university medical school. It has been generally conducted by groups of practitioners—sometimes with excellent purposes and motives, sometimes with a very strong commercial flavor. The postgraduate school should be by all means a part of the university medical school. To no other men will the spirit and ideals of the university hospital, laboratory and medical school be more welcome. And in no way can the medical school educate the people of a whole state so surely as to establish a helpful relation with every practitioner in the most remote village who has ambition for improvement. Every such postgraduate student becomes a center of education in the public health.

It ought to be clear to the layman as well as to the practitioner of medicine that a single school of modern medicine in a state like Indiana is the true solution of the problem of educating practitioners of medicine and of serving the public health. Indiana to-day has about as many doctors to the square mile as any state in the Union. For every 500 inhabitants, including men, women and children, there is an Indiana physician. This result is in part due to the fact that near the state of Indiana is the city of Chicago, which is the great factory for medical degrees. I regret that an institution in this state still conducts a medical school in Chicago. There is no justification for a second school of medicine in Indiana. One moderate-sized medical school, conducted on right lines, can supply more physicians than the state of Indiana can possibly absorb. For many years to come there will continue to be many more physicians, at least in name, than the state needs. In time we may hope that with a growing education of the public, the layman will select his practitioner of medicine with at least as much care as he would select a clerk or a foreman, that he will at least make some inquiry as to the source of his medical education and the extent of his medical experience. Until the public can be educated to know the difference between a well-trained practitioner of medicine and one who obtained a degree by short-cut methods, the whole problem of the public health will be delayed.

In this connection I venture to spend a moment to emphasize one phase of this problem which is very commonly misunderstood. The plea put forward in behalf of the commercial medical school is couched in terms calculated to deceive the public. The commercial medical school describes itself as an institution maintained in the interest of the poor boy, and, secondly, as an institution devoted to the training of the country physician. If one reads the catalogs of these institutions, one can easily believe that in the commercial medical school as in no other institution the interests of the poor boy and of the resident of the country are deeply cherished. Both claims are without foundation. The poor boy pays as much money to go to a commercial medical school as he does to a medical school conducted in the highest spirit. This has to be because the commercial medical school exists only on the fees which the students pay, notwithstanding the fact that those who conduct such schools expect their return in the by-products of the school rather than in the fees. The boy of limited means is too often tempted into such a school and discovers too late that the kind of education he receives is not that which enables him to deal with disease.

The argument of the commercial school that only by its existence can the country side be settled with physicians is clearly misleading. The very idea is abhorrent to all sense of social justice. Are we deliberately to create a situation in which the men and women who live in the country are to accept an inferior type of medical practitioner? Is our civilization so constituted that we must provide one class of practitioners for the city and another for the country? As a matter of fact there is absolutely nothing in this contention. It is true that the graduates of the strong medical schools and of the weak medical schools alike go in overwhelming numbers into the cities. It is equally true that the graduate of the good medical school goes to the little town and to the country wherever he can make a living. A most careful examination has shown that a physician of the best training can be secured in any village or country-side where the practitioner of medicine can earn even a modest living. If there were being turned out from the medical schools only men rightly trained in some proportion to the number of places available, one can foresee the time when all places which could furnish a moderate living to the physician could be supplied. There are parts of our country so sparsely settled that no practitioner of medicine, whether well-prepared or ill-prepared, could make a living. For such a situation, a solution of a different kind must be found, and this is one of the problems with which the public health service of the state will in the long run deal. The fear that the country would be bereft of doctors if the inferior medical schools were abandoned is one of the singular theories, founded partly on lack of knowledge of the situation, partly on the assertions of those directly interested in keeping alive such schools.

One has only to recall the way in which young men come into the practice of medicine to realize the hollowness of the statement. The country or village doctor is in nearly all cases the neighborhood boy—oftentimes the son or the nephew of the resident practitioner. He gets his preliminary education in the neigh-

borhood and goes off to the medical school and returns to take up the practice gradually being given up by his elders. The question whether he goes to a poor school or a good one has little to do with his return.

I venture also to say one word of the significance to the state and to the public health service of an educated profession of medicine. No method has been devised in our country or on the other side by which unfit men can be excluded from the profession of law, of medicine, or of the ministry, or of any other great profession, but the experience of the older country shows that there is one condition which can be imposed which does more than all others to bar out the unfit and the unworthy, and that is the standard which is imposed by the demand for a high order of preliminary education. No other condition can be imposed which will in the long run bring together so unselfish, so skilled, so devoted a class of men into a profession as the demand for a good preliminary education. Among our American communities this demand also has been looked on as somewhat undemocratic, an argument which has been used with the greatest possible effect by the commercial medical school. As a matter of fact, there is nothing undemocratic in such a demand. The right to practice medicine is not one into which a man is born. It is a right conferred on him by the state under such conditions as the state may fix. There is no condition which the state can make which in the long run will bring into the service of the profession and of the public, physicians of such high order as the requirement that they shall be, first of all, educated men, and the influence which the profession itself will have on the public will never attain its right proportions until such a condition has been accepted.

Looking forward then to the history of medicine in your commonwealth for the next decade, one can well believe that the conservation of the public health will be one of the chief functions of the state, that this work will be carried out by an organization so planned that all its factors may cooperate freely and heartily, and that the very center of such organization, furnishing to it the life-blood of devotion, of enthusiasm and of high endeavor, will be the state school of medicine, where practitioner and teacher, where student and investigator mingle together in an atmosphere which is charged not only with scientific skill, but also with the highest conceptions of patriotism.

Safe Drinking-Water.—Allen J. McLaughlin in *Public Health Reports*, June 26, 1914, says that there is a tendency in America to accept any raw water, however bad, as a source of supply for a municipal filtration-plant. This places an unreasonable burden on the filtration-plant, which not only depends on proper mechanism, but which also must be operated under careful bacteriologic control and is subject to the results of human error. While properly constructed filter-plants can produce safe water from bad raw water, especially by the use of hypochlorite or liquid chlorin, the responsibility of effecting such purification every hour of every day in the year is unreasonable and unfair, and raw water demanding such extraordinary treatment, constitutes a constant threat of disaster. There is no margin of safety under such conditions, and raw water should be furnished of such character that a plant can turn out safe water without the aid of chemical germicides. This would reserve chlorination as an additional margin of safety for use in extraordinary fluctuations of the raw water or during accidents to the plant.

INSTRUCTION IN ROENTGENOLOGY

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AND

LODILLA AMBROSE, PH.M.

NEW ORLEANS

The committee of the Deutsche Röntgen-Gesellschaft has submitted its report on instruction in medical roentgenology in the German higher institutions, this report has been sent to the medical faculties of the German-speaking higher institutions of Germany, Austria and Switzerland, and it has also been published.[1] Some parts of it have been taken from data collected by Klingmüller, Kienböck, Holzknecht and Kreuzfuchs, and published in Volume XIX of the *Fortschritte*.

After calling attention to the rapid advances made in Roentgen science during a decade and a half, and to the utilization of this science by nearly all other branches of medicine, the report says:

> Therefore, if complete medical training is to be secured in the universities, it is quite essential that there be the possibility of obtaining a systematic knowledge of roentgenology.

It is from this point of view that the Deutsche Röntgen-Gesellschaft has undertaken to direct the attention of the medical faculties of the various German-speaking institutions to the necessity of thorough instruction in roentgenology, and to the desirability of having the fostering cooperation of the universities in future research in this field.

The report summarizes the results of the "unwearied work of doctors and physicists" in the few years in which the x-rays, that is, the unknown rays, have been subjected to investigation. This work has made roentgenology an "independent specialty," which has both manysidedness and also oneness. Just as the fact that no physician can dispense with a knowledge of internal medicine does not exclude the need of specialization in internal medicine, so the utility of some insight into Roentgen procedures on the part of the general practitioner does not nullify the advantages of specialization in roentgenology. This specialty requires in a marked degree a broad and deep foundation in general medicine and the other specialties. Even in these few years, the Roentgen technic has become complicated and hence difficult, whether used for diagnostic or therapeutic purposes. Some of the injuries that a false therapeutic technic may cause have already been found out. To have any real value, both the fluoroscopic examination and the making of plates must be carried out with accurate technic, and the interpretation must be made with good knowledge of the sources of possible errors. Faulty, or even moderate, Roentgen technic is ineffective, and may be injurious.

To quote a few sentences from this report:

> The erroneous idea that one needs only to be well versed in general medicine, in order to be able to interpret a Roentgen picture, is even to-day too wide-spread. Only on the basis of a many-sided experience gained by earnest study continued for years is it possible to analyze correctly that which is seen, and then, to interpret it, and to separate the essential from the non-essential. The interpretation of the

1. Der Unterricht in der medizinischen Röntgenologie auf den Deutschen Hochschulen, Fortschr. a d. Geb. d. Röntgenstrahl., Hamburg, 1913, xxi, 245.

Roentgen picture, therefore, requires knowledge which embraces almost the entire field of medicine and a good part of physics, and in addition a fundamental special experience. This is demonstrated also by the frequently observed fact, that many a specialist in another branch, who was using roentgenology in his specialty, finally either devoted himself entirely to roentgenology, or, if he remained true to his own subject, was no longer able to follow the advances of roentgenology. To master simultaneously and completely roentgenology and another specialty is in general impossible. The field of roentgenology has already become too great for that.

It was in view of such facts as these that the Deutsche Röntgen-Gesellschaft (with 609 members, almost nine-tenths of whom are active roentgenologic physicians) at its eighth congress, 1912, unanimously adopted the following resolutions:

1. Roentgenology is a fully justified medical specialty.

2. The roentgenologist is a specialist, and as such, and in accordance with generally accepted usages, is consulted by physicians or patients for the making or the verification of a diagnosis.

3. The roentgenologist, in addition to general clinical methods, makes use of the Roentgen procedure. He decides which procedure (photograph, fluoroscopic examination, orthodiagraphy, teleroentgenography, etc.) should be used.

This consensus of opinion has led to the expression of a desire that "in accordance with the ever-increasing importance of roentgenology this specialty henceforth be taught in the higher institutions by its own representatives, by a lecturer with this as his main line who receives a teaching appointment for this specialty."

The details of the report on the existing instruction in roentgenology in the German-speaking higher institutions might not be pertinent at this distance. But the conclusion drawn from these data is that this instruction is not now adequate, that roentgenology is not being taught to an extent consonant with its importance. At present almost the only available way for a physician to orient himself in the general field of roentgenology is to itinerate from one factory to another for certain phases of the subject, and from one clinic to another for others. The fact is emphasized that this situation does not accrue to the interest of this specialty or to that of medical science as a whole. The entire subject in all its multiplying ramifications should be transferred to the universities, and teaching should be done by specially prepared instructors. The retention of Roentgen outfits already in use in connection with the several specialties is contemplated, but in correlation and cooperation with the central roentgenologic department. The anticipated resultant advantages to all are great. Medical roentgenology will be taught where all other branches of medicine are taught—in the universities. Each of the other specialties need teach only such parts of roentgenology as pertain directly to its work. The Roentgen specialists themselves "constantly can test out the newly created methods of the restlessly advancing technic, before the clinics squander time and money on them; further, in difficult cases they can assist the physicians of the other clinics technically and scientifically; they can support the proficient with expert advice, and, above all, enlarge the scientific work of the specialty, as well as prepare a secure place for roentgenology in academic instruction."

The report also notes that, if it is granted "that every physician entering practice must have at his disposal a certain but not too limited degree of systematic information about roentgenology," then "there follows also the necessity of taking account of this requirement in state medical examinations."

The positions taken regarding instruction in roentgenology by these compatriots of Roentgen seem justified by the facts presented. This being granted, these positions may be considered as applicable as fully to this country as to the countries for which they were originally formulated.

This report has led us to a study of the roentgenologic instruction in the United States. For this purpose has been chosen the list of the "A plus" group of medical colleges as given in THE JOURNAL of the American Medical Association, August 23, 1913, p. 585. The latest catalog (that is, the publication representing the teaching work of 1912-1913 or the announcements for 1913-1914) of each of these institutions has been carefully examined for information regarding instruction in roentgenology of whatever quality or quantity. Only a summary of the details of this compilation will be given here:

1. *Titles Used in Designating This Instruction.*—The terms used in referring to the subject are, actinography, radiography, radiology, roentgenology, Roentgen ray and x-ray, with more institutions using the word "roentgenology," than any other one term. This is also the word adopted in Germany. Of the institutions whose catalogs furnish any data, two have professors of this one subject, two have an associate professor for this and another specialty combined, two have an instructor for roentgenology; two, a lecturer; one, a demonstrator, and some of these have assistants in addition; five recognize positions of varying titles in connection with some hospital: all of which tends to show that up to the present time there has been no standardizing of the position of the teacher of roentgenology in American medical colleges.

2. *Roentgenology as a Distinct Department of Instruction.*—Four institutions—Northwestern University, Harvard University, Cornell University and the University and Bellevue Hospital Medical College—recognize roentgenology as a distinct department of instruction coordinate with the other medical specialties. In those institutions in which a course in roentgenology is offered but in a subordinate relation to some previously existing department, there is no uniformity as to the department with which it is incorporated.

3. *Year in Which Instruction in Roentgenology is Offered.*—Concerning the institutions whose catalogs furnish any data, the facts are: undergraduate course, required, in second year, 1; in third year, 2; in fourth year, 6; in third and fourth years, 1; undergraduate course, elective, in fourth year, 1; graduate course, 1.

4. *Number of Hours of Undergraduate Instruction in Roentgenology, and Character of Instruction Whether Didactic or Laboratory* (exclusive of use of plates to illustrate work in other subjects).—Concerning the institutions whose catalogs furnish any data, the facts are: *Didactic,* instruction given but hours not stated, 4; "all day throughout the year," 1; 9 hours, 1; 11 hours, 1; 16 hours, 2; 17 hours, 1; 30 hours, 1;—*laboratory,* "elective," 1; instruction given but hours not stated, 1; 40 hours, 1; 51 hours, 1.

The self-evident conclusion from this study of the official catalogs of the medical colleges in the "A plus" group is that in about one-third of them instruction in roentgenology is omitted altogether, and that in the

others it has no standardized status. Further, this being the case in the highest group, it is fair to infer that still less instruction in this subject is given in the other groups. Therefore, it becomes apparent that the opportunities in this country for the systematic study of medical roentgenology are very meager.

Yet the Council on Medical Education of the American Medical Association enumerates "Roentgen-ray apparatus" among the "essentials of an acceptable medical college," and the Association of American Medical Colleges in its "proposed minimum standard for clinical equipment," says, "Adequate rooms and equipment must be provided for x-ray work and for electrotherapeutics." Highly complicated technical apparatus certainly implies technical instruction in its use, its limitations and its dangers.

As a branch of medicine, roentgenology is in touch with all other branches of medicine. Although it is associated more closely with some of them than with others, experience has demonstrated its possible service to the other medical specialties, and the growing dependence of these specialties on roentgenologic findings. Roentgenology is a new science but it has already made contributions of value. In view of the extensive and increasing applicability of the Roentgen rays both in diagnosis and therapy, has the time not fully come when some adjustment should be made in American medical colleges which will give to roentgenology its logical place in medical instruction and research? If it is not taught systematically, how can the best results be obtained in actual practice? Can any American medical college otherwise well-equipped afford to ignore it? Does roentgenology not deserve a definite status in the medical curriculum?

PUBLIC HEALTH WORK AS A CAREER*

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The medical profession has always made a strong appeal to young men of fine character, as offering a career unsurpassed in opportunities for real human service. It is essentially that type of profession. To-day, with the rapid development of the science of preventive medicine, the opportunities are still greater, and the appeal to young men of high aims stronger than ever before. Particularly is this true in the comparatively new field of public health service.

This is the day of the efficiency expert. The public health officer is an efficiency engineer in the most important department of human life — good health. He is a constructive searcher after truth. Instead of tamping and patching up the machinery here and there, he builds anew. He has to know the whole works, not merely one process; he deals with society as a whole, instead of with a few separate units. Translated into the terms of his calling, his task is to keep all the people well and strong, instead of concerning himself only with the unfortunates who come to him in dire necessity. Economically, he is a wholesaler, free and unrestricted in his operations, dealing in a commodity everybody wants, rather than a retailer with whom, generally speaking, nobody really wishes to do business. He is the servant of the community, tied to no man, but free to do his duty as he sees it, whether that duty be to purge a Cuba of yellow fever, clean a pestilential Panama, or wipe out the double scourge of hookworm and typhoid from some rural community. The public health officer is dependent for his material rewards, not on haphazard personal fees, but on the good faith of a public which is fast learning to pay adequately for adequate service by experts.

For a young man on the threshold of his career, however, there are certain very practical points to be considered. At least three questions may be asked by any vocation, whether it be public health work, private medical practice or any other. First, what are the immediate chances of employment? Second, what is the compensation? Third, is the work sufficiently permanent in character to warrant giving one's life to it? These three questions are fundamental. How does the field of public health work measure up to them, especially when compared with that of private practice of medicine?

It may be stated with full assurance at the outset that there are already more positions open for trained health officers than can be satisfactorily filled. The demand is increasing all the time. It comes from federal, state and city health departments; from the International Health Commission and similar quasi-public health agencies; from the schools, and more recently from rural counties. Medical inspection of schools has made rapid strides in the last year or two, both city and county. Twenty-one states now have medical inspection laws, ten of which are mandatory; while in many of those states without special laws on the subject many individual cities have inaugurated medical inspection systems. The medical inspection work is more and more being centered about the whole-time health officer. Maryland is looking for men to fill positions created by the sanitary district bill passed at the last legislature. New York State is in the market for a large number of trained health officers. North Carolina employs eleven whole-time county health officers at salaries that attract capable men irrespective of residence. Sooner or later all the states will exert that control over hygienic and sanitary conditions which a few now exert, and this will mean an ever-increasing demand for public health officers to give their entire time to the community. Already some of our educational institutions are coming forward with special courses to train men for the new work — the "School for Health Officers" of Harvard and Massachusetts Institute of Technology is sufficiently well known; and at least five American universities—Harvard, Pennsylvania, Michigan, Wisconsin and Tulane—now grant the degree of Doctor of Public Health for special public health work over and above the requirements for the regular medical degree.

With the increased demand for trained health officers has come higher compensation for such work. Specially trained men are commanding salaries much more nearly adequate than in the past. In the days of political appointments the candidate for health officer was glad to get a small regular salary for a little of his time to supplement his always uncertain and frequently uncollectable private fees. With whole-time men engaged, better salaries come as a natural development. Already the salaries paid health officers compare more than favorably with the present incomes of private practice. Investigation has shown that, despite the large earnings of a few medical men, the average

* Address delivered at the Commencement Exercises of the Medical College of Virginia, Richmond, June 2, 1914.

salary for a physician in the United States is between $800 and $1,200.[1] In New York City the salaries of health officers range from $900 to $1,500, but this amount is felt to be so little that the physicians are allowed to take some outside practice. Salaries of school medical inspectors in twelve cities enumerated by Dr. Heitmuller, of Washington, D. C., ranged from $1,200 to $2,000.[2] These figures do not include the administrative pay in public health work, which is of course much higher. Surgeon-General Blue, of the United States Public Health Service, notes that the municipalities are offering such good inducements that many of the men in his branch of the government are leaving the service to take positions as health officers, and he foresees a steady rise in compensation.

That salaries will continue to grow better in public health work is evident from an analogous development in another field in which what was once a private, individual matter has become a public function — that of education. When school superintendents were elective the pay was low and tenure insecure, and few thoroughly capable men were attracted to the profession. To-day the city school superintendent is one of the highest paid of municipal officers, and enjoys an independence of political affiliations that is the envy of other public officials. It happens that in the case of state and county school superintendents the process has not been completed; in some states partisanship has been entirely eliminated from the schools, and school officers are on a thoroughly professional basis; in others this is not yet the case. It is possible to look over the states and tell at a glance where the pay is high or low, according to whether the position is or is not political. New Jersey's commissioner of education is an educational expert who receives $10,000 a year. His politics have never been inquired into; he was brought from a distant state because he was considered the best man for the position. Nebraska's state superintendent of public instruction, nominally with the same qualifications as New Jersey's commissioner, is elected on a party ticket. He is paid $2,000 a year. The county superintendents in the six to nine hundred dollar class are for the most part in states that have not yet fully accepted the scientific attitude toward expert public service; the $3,000 county superintendents are in states that have learned, as all will soon learn, the basic economy involved in high pay for expert service.

What has taken place in the field of education is taking place just as definitely in the field of public health work. More enlightened public sentiment with regard to medical standards is removing the health officer from politics and increasing his pay to a point at which well-trained men are sought and obtained for the work.

To ask if public health work will be permanent is to ask whether good health will always be desired and whether community spirit will grow. The public health officer need not fear for employment; he is a necessary factor in progress. His field, dependent as it is on community good health, rather than individual ill health, will grow ever more important as prevention replaces treatment in the handling of disease. The young man inclined to choose between private practice and public health work would do well to bear in mind the essentially permanent character of community health service, unaffected by the many temporary conditions that make or unmake opportunities in the field of private practice.

One thing is certain. The field of public health work is no place for the poorly trained medical man. Medical men are needed for health work, but only highly trained medical men. The public is going to employ more and more health officers; it will be liberal in its compensation, but it will insist on men specially equipped for the work. At present it is difficult to get the precise training that is needed. The universities and medical schools are just beginning to awake to the supreme importance of positive health work in the community as compared with mere negative combating of disease. The health officer should have something that will do for his future work what the hospital does for the ordinary medical man. In default of other agencies to provide this special preparation, new agencies will have to be devised; and pending this, promising young men who have completed the regular medical course in the institutions of higher grade should be selected to serve an apprenticeship under trained health officers in actual service, both in the field and in the administrative offices.

Once get the idea of the trained health officer at his work, mapping a community, surveying it with a view to sound principles of sanitation and inspiring the citizens with the ideals of healthful living, and it does not require a much greater flight of the imagination to see this work of survey, prevention and health-teaching done everywhere — in all local communities, under county supervision; in all counties, under efficient state supervision, and all states under efficient national supervision. One might go a step further and picture a broadly organized international health organization, making a survey of the leading nations, taking the best to be found in the experience of the different nations and setting up standards for all the nations to attain. All this may seem too far afield; or at least too remote for men now living; but it does not seem so impossible of realization when we consider the other scientific achievements of our day, in medicine itself, if you please; and a vision like this will in any case serve to reassure those who may enlist in this war that it is not a war of a day, or even of a generation, but a permanent indispensable service to society.

There appears to be some danger that the public health work may to some extent escape the control of those most competent to direct it—the medical profession. This is emphatically a movement in which leadership belongs to the trained medical man. The lay sanitarian, no matter how efficient he may be in his own particular line, cannot wholly take the place of the physician, with his peculiarly valuable background of education and human experience. As routine medical treatment yields before preventive medicine, readjustment will have to take place; but I believe that readjustment is nearer than many of us realize; and I have sufficient faith in the men of my profession to believe that in large measure this readjustment will come from within. Something like it is already taking place in England, where the community ideal has recently gone forward by leaps and bounds. The spirit certainly exists among medical men in the United States. Does not the constitution of the American Medical Association recite that its aim shall be the "enlightening and directing of public opinion in regard to the broad problems of hygiene"? And the corresponding section of the constitution of the North

1. Pennsylvania Med. Jour., 1901-1902, v, 362.
2. From unpublished memoranda.

Carolina State Medical Society goes even further in acknowledgment of the public health aim of the medical profession — it not only urges the extension of medical knowledge, better standards of medical education and "the enlightenment and direction of public opinion in regard to the great problems of state medicine," but urges as the motive for this "that the profession shall become more capable and honorable within itself, *and more useful to the public in the prevention and cure of disease and in adding comfort to life.*"

Surely no richer field of labor can be conceived of than that of public health work. The medical man has always stood for something a little more than just his profession; as confidant, as valued counselor in time of trouble, as the keeper of family secrets, he has played the rôle of an idealist in human history. Add to these individual and personal attributes of the old-time physician the ideals of the health officer in his social service of to-day, of positive effort in behalf of all his fellowmen, and you will produce a band of men who will indeed be valued guardians of the outposts of civilization.

THE VALUE OF THE MEDICAL COLLEGE LIBRARY TO THE STUDENT *

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PHILADELPHIA

Only in recent years have medical colleges realized the value of a medical library as an essential part of the college equipment. Medical students two decades ago were without the help of a medical library; they had to be content with a case of books, largely obsolete, in a corner of some out of the way room. A student in those days was expected to do his reading in his preceptor's library. Often older graduates, on visiting our library, have said to me, "We didn't have anything like this when I was a student."

A modern medical library, in charge of an experienced librarian, is one of the requirements of the Council on Medical Education of the American Medical Association. To receive recognition as an acceptable medical college, "The college should have a working medical library to include the more modern text and reference books with the 'Index Medicus' and thirty or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge."

The maintenance of a well-equipped medical library as a part of the medical school or college has a number of advantages. In the first place it is a convenience to the students in that it makes it unnecessary for them to carry about a number of their own text-books to which they might wish to refer. The library, however, is not intended to take the place of the students providing themselves with such books as they should have for their own use in their homes. Some students are not in a position to supply themselves with all the necessary text-books required, and for these the library provides an aid much desired and appreciated. Were it not for the library facilities, these students would be compelled to follow such notes as they could take in the lecture room and clinic. The instruction so acquired would satisfy those students who were simply bent on gaining sufficient knowledge to pass their examinations. They would not, however, have the broader knowledge and culture obtained by the students who supplemented their lectures and clinics by reading the fuller accounts in the various standard text-books and systems, as it is not possible for any teacher to cover in detail in the time allotted the many subjects of his particular branch of medicine as fully as it is given in an authoritative text-book. It is necessary for the student, while in college, to confine himself to certain text-books and instruction of his teachers, but by reading he can become familiar with the opinions and methods of other authorities which it would be well for him to know, not so much for use during his medical course, but as a broader knowledge for use in his future professional career.

Another advantage of the medical college library and a comfortably equipped and attractive reading room, easily accessible, well-lighted and heated, is that it encourages the student to use the library during his odd moments instead of wasting his time on the streets or elsewhere.

Possibly the greatest advantage of such a library is that it places about the student an environment which has a tendency to inspire in him a desire to read and become acquainted with the literature of his profession so freely available. It gives the student the opportunity to keep in touch with the literature in the more important current medical periodicals, and to become acquainted with the recent books and monographs on special subjects. If there is only time to look hastily through them and to become sufficiently familiar with them to know that such a work has been written on that particular subject, it will be valuable knowledge that will prove helpful at some future time.

To cultivate in the student the habit of reading in the odd moments and spare time of his medical course is to be encouraged and fostered in every way, for the possession of such a habit after entering on practice will be of inestimable value to him. It is safe to say that many who do not acquire this habit during their college career never attain it after graduation.

The great difficulty in endeavoring to encourage the acquiring of this habit by the student is the very limited spare time allowed in our already crowded curriculums.

The teacher who is himself thoroughly familiar with the literature of his profession can accomplish a great deal in the way of creating in the student an interest in seeking further information and knowledge by referring in his lectures and clinics to the masterpieces of medical literature, or to the biographies of those to whom the medical profession is indebted for their pioneer work or achievements in medicine and surgery. He can refer his students to the originals of articles which present results of experiments or investigations that have proved epoch-making. This avoids the necessity of the student investigator using his limited time to wade through a lot of valueless and ephemeral literature in order to find these masterpieces of scientific research.

Dr. Thomas McCrae of our faculty has followed the plan of assigning to certain students the preparation of a brief biography of those on whose experiments and investigations have resulted the foundation

* Extract from a paper read at the seventeenth annual meeting of the Medical Library Association, Atlantic City, June 22, 1914.

principles of some of our progress in medicine. These biographies are read by the student before the class prior to the lecture on the particular disease or subject at hand, and are made more interesting by the additional remarks that may be made by the teacher.

It is a regrettable fact that the great majority of our medical students graduate and pass out of the medical college and enter on their professional careers with practically no knowledge of how to obtain the literature on a particular subject should they wish to prepare a paper or to do research work. They do not have the least idea where and how to look up references and that such references even exist outside of their text-books. They know practically nothing of the value and contents of the "Index Catalogue" and the "Index Medicus" or how to use them. Of course they have had little or no occasion to refer to these during their college course, but it seems to me that every graduate in medicine should be familiar with these publications and know how to use them.

Would it not be well for our medical colleges to provide somewhere throughout the course in medicine an opportunity for instruction in the use of the various indexes and bibliographic reference works so valuable to the medical writer and investigator? Could not this instruction best be given by the one most familiar with the subject, the librarian in each institution?

This instruction would include the explanation of the use of the card catalogue of the local library, the contents, arrangement, mode of using to obtain the information desired in the least space of time and in the most thorough manner, of the various bibliographic indexes such as the "Index Catalogue of the Library of the Surgeon-General's Office," the "Index Medicus," the various year-books, annuals, *Jahrbücher* and *Jahresbericht;* where and how to find abstracts, as in the "Current Medical Literature" section of THE JOURNAL of the American Medical Association and the *International Abstract of Surgery* and the various *Centralblätter;* and information as to how to obtain publications from the Library of the Surgeon-General's Office in towns where there are no medical libraries or where the library does not have the desired books. All this and much more helpful information might be given in such a talk.

While the student would not recognize the value of such instruction while in college he would readily appreciate it when entering on his medical literary work.

Would not the "knowing how" thus acquired by the student be an impetus to him in the preparation of any papers that he may wish to write or in doing reference work for others?

When a student has fully realized the value of a library, when he has learned the relative value of the literature of medicine and has become acquainted with the various methods of bibliographic work and the use of library facilities, he has laid a literary foundation that will be an efficient means in acquiring a better medical education and a broader medical culture.

It is hoped that the foregoing will impress on those in authority in our medical colleges the essential value of the medical library to the institution and especially to the students, and help to inculcate in the student a greater desire to avail himself of the abundant opportunities afforded for the widest possible knowledge to be acquired in his chosen profession.

Tenth and Walnut Streets.

FOREIGN BODIES IN THE BLADDER

LOUIS GROSS, M.D., SAN FRANCISCO

While the literature teems with interesting cases of foreign bodies in the bladder, the first case here recorded is unique in many respects and should teach us a few valuable facts.

C. K., of San Bernardino, Cal., hotel proprietor, was referred to me with the following history: Family history was negative. Patient had some difficulty in urination, for the relief of which a suprapubic prostatectomy was done, June 27, 1912. Following the operation the patient had two postoperative hemorrhages; suprapubic drainage was removed three weeks later; patient urinated through the urethra from five to six weeks after operation; bladder wound closed in the ninth or tenth week. Patient consulted Dr. George K. Herzog, June 16, 1913, almost one year later, and was immediately referred to me. His history was one of continued frequency of urination, nocturnally and diurnally, tenesmus, and stinging pain at glans penis. Urinary examination showed turbidity, acid reaction, 1.030, no casts, many red blood-cells, no crystals, and a few spherical epithelial cells. Cystoscopy showed a calculus in the bladder.

June 19, litholapaxy was done and a large amount of fragments was removed with the evacuator. Patient also passed a considerable number through the urethra. As not all were crushed in the one sitting, June 21, Nitze's operation-cystoscope with lithrotite attachment was used; as operation became too painful, nitrous oxid-oxygen anesthesia was given. Many small fragments were broken and then a foreign substance was caught in the jaws of the instrument, which was also *attached to the bladder wall* at the site of the previous prostatectomy. A suprapubic cystotomy was then performed and what was thought, when observed through the operation-cystoscope, to be a piece of gauze, proved to be a piece of the ordinary soft-rubber catheter about 20 F. and about 1½ inches long. The catheter was attached to the wall of the bladder at the site of the former operation. Patient made an uneventful recovery. July 16, cystoscopy showed a normal bladder. This case is recorded to warn us of the great danger lurking in the use of deteriorated rubber drainage-tubes, to urge the testing of all tubing before insertion into the bladder, the avoidance of tubing too small in caliber, and to examine all cases of this character cystoscopically as a control.

A physician called on me one morning much disturbed and related the following interesting story: A patient of his had a stricture of the urethra which could not be passed by sounds of ordinary size. After the use of all the smaller sizes of exploratory bougies he used a filiform, succeeded in entering and immediately passed a Gouley tunneled sound. During this manipulation the filiform suddenly slipped beyond his reach and entered the bladder. I informed him that a stricture admitting only a filiform would not allow the passage of an operation-cystoscope for its removal; furthermore if he would wait a few days the filiform would pass out. Being obdurate to this plan of procedure, the patient was brought to my office the same afternoon. Various sounds were tried without success until I changed my position from the right to the left side of the patient. This is a method we should take note of, as often the tip of the sound will be caught in a pocket and the shifting of one's position from left to right or vice versa will cause supposed strictures to disappear immediately.

With the Buerger operation-cystoscope and with a long pair of Buerger forceps passed through this instrument, the edge of the filiform was grasped and removed through the instrument. I may state here that in the removal of filiforms, it is necessary to grasp the filiform at either thin end and not in the thick center.

This case teaches us the necessity in the treatment of filiform strictures of exercising great care in grasping the filiform with a pair of hemostatic forceps as soon as the Gouley tunneled sound or catheter is passed over the filiform; otherwise it may be carried into the bladder.

45 Kearny Street.

MEDICAL COLLEGES OF THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA BY THE COUNCIL ON MEDICAL EDUCATION

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received the information published is from other reliable sources. Figures for graduates include all who graduated since July 31, 1913. Extracts of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's returns for 1910. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work.

ALABAMA

Alabama, population 2,138,093, has two medical colleges, the School of Medicine of the University of Alabama and the Birmingham Medical College, located, respectively, in Mobile and Birmingham. The population of Mobile is 51,521 and of Birmingham 132,685.

In order to secure licenses to practice medicine in Alabama, students matriculating in the session of 1915-16 and thereafter, must have completed *two years* of work in an approved college of liberal arts including courses in physics, chemistry, biology and a modern language prior to entering on the study of medicine.

Birmingham

BIRMINGHAM MEDICAL COLLEGE, Avenue F and Twentieth Street. —Chartered in 1894. The first class graduated in 1895. In 1913 became the Graduate School of Medicine of the University of Alabama. There are 19 professors and 13 assistants, total 32. The course of undergraduate instruction now embraces one session of eight months. Only seniors will be enrolled. When this class has graduated, the college will cease to do undergraduate teaching. The fees are $130. The secretary is Dr. E. P. Hogan. Registration, 1913-14, 57; graduates, 30. The twenty-fourth session begins Oct. 1, 1914, and ends May 28, 1915.

Mobile

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, St. Anthony and Lawrence Streets.—Organized in 1859 as the Medical College of Alabama. Classes were graduated in 1861 and in all subsequent years except 1862 to 1868, inclusive. It was reorganized as the Medical Department of the University of Alabama in 1897. All property was transferred to the University of Alabama in 1907, when the present title was assumed. At present, one year and, for the session of 1915-16, *two years* of college work will be required for admission. The faculty consists of 14 professors and 41 lecturers and assistants, a total of 55. The course of study covers four years of thirty-two weeks each. The total fees for each of the four years, respectively, are $160, $155, $155 and $175. The Dean is Dr. Eugene D. Bondurant. The total registration for 1913-14 was 94; graduates, 21. The forty-ninth session begins Sept. 24, 1914, and ends June 9, 1915.

ARKANSAS

Arkansas, population 1,574,449, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 45,941.

To secure licenses to practice medicine in Arkansas, students matriculating in the session of 1915-16 and thereafter must have completed at least one year of collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine. This applies to all graduates of 1919 and thereafter.

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class graduated in 1880. The faculty consists of 15 professors and 36 lecturers and assistants, total 51. Entrance requirements will be increased to include a year of collegiate work beginning with the session of 1915-16. The course of study covers four years of thirty-two weeks each. The fees are $125 for each of the first three years and $150 for the fourth year. The Dean is Dr. Morgan Smith. Total registration, 1913-14 was 95; graduates, 34. The thirty-sixth session begins Sept. 14, 1914, and ends May 13, 1915.

CALIFORNIA

California, population 2,337,459, has eight medical colleges. Four are located in San Francisco, a city of 416,912 inhabitants. They are Leland Stanford Junior University School of Medicine, College of Medicine of the University of California, Hahnemann Medical College of the Pacific and the College of Physicians and Surgeons. The College of Physicians and Surgeons and the California Eclectic Medical College are situated in Los Angeles, population 319,198. The Oakland College of Medicine and Surgery is in Oakland, population 150,174. The College of Medical Evangelists is located at Loma Linda, a village of 110 people.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students matriculating in medical colleges in and after the session of 1915-16 prior to such matriculation must have completed at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language. This applies to all graduates of 1919 and thereafter.

Berkeley-Los Angeles-San Francisco

UNIVERSITY OF CALIFORNIA COLLEGE OF MEDICINE. University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1865. In 1872 it became the medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. *Two years* of collegiate work are required for admission. The work of the first two years is given at Berkeley and the work of the last two years at San Francisco. The faculty is composed of 21 professors and 55 associates and assistants, a total of 76. The course covers four years of nine months each. Fees for the four years respectively are $195, $180, $165 and $165. The Dean is Dr. Herbert C. Moffitt, San Francisco. Total registration for 1913-14 was 124; graduates 13. The forty-second session begins Aug. 7, 1914, and ends May 8, 1915.

Loma Linda

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty numbers 11. The first class graduated in 1914. The course extends over five years of nine months each, but includes a study of the Bible and evangelistic training—non-medical subjects. The total fees each year are $136; matriculation fee, $5, payable but once; graduation fee, $10. The Dean is Dr. Alfred Shryock. The total registration for 1913-14 was 75; graduates, 6. The sixth session begins Sept. 13, 1914, and ends June 8, 1915.

Los Angeles

COLLEGE OF PHYSICIANS AND SURGEONS, 516 East Washington Street.—Organized in 1903, first class graduated in 1905; became Medical Department, University of Southern California Aug. 11, 1909. The course covers four years of nine months each. One year of collegiate work is required for admission. The faculty consists of 19 professors and 59 associate professors, lecturers and instructors, a total of 78. The fees for the four years respectively are $177, $172, $160 and $175. The Dean is Dr. Charles W. Bryson, Delta Building, Los Angeles. The registration for 1913-14 was 153; graduates 34. The next session begins Sept. 9, 1914, and ends June 10, 1915.

CALIFORNIA ECLECTIC MEDICAL COLLEGE, 846 Lyon Street.—Organized in 1879 at Oakland as the California Medical College. Removed to San Francisco in 1887. Suspended in 1906. Reorganized at Los Angeles with the present title in 1907. Classes were graduated in 1880, and in all subsequent years except 1907. The registration for 1913-14 was 38; graduates, 11.

Oakland

OAKLAND COLLEGE OF MEDICINE AND SURGERY, Thirty-First and Grove Streets.—Organized in 1900, opened in 1902. The first class graduated in 1906. The faculty numbers 44. The course covers four years of nine months each, and the classes are limited to ten students each. The total fees for each of the four years, respectively, are $210, $200, $175 and $175. The Registrar is Dr. Edward N. Ewer. The total registration for 1913-14 was 15; graduates, 3. The thirteenth session begins Aug. 18, 1914, and ends May 22, 1915.

San Francisco

HAHNEMANN MEDICAL COLLEGE OF THE PACIFIC. Homeopathic. Sacramento and Maple Streets. —Organized in 1881 as the Hahnemann Medical College. The first class graduated in 1884. In 1888 it became the Hahnemann Hospital College of San Francisco. It assumed the present name in 1902. It has a faculty of 22 professors and 16 lecturers, instructors, etc., a total of 38. The course covers four years of thirty-four weeks each. Total fees for the first year are $155, and $100 for each of the other three. The Dean is Dr. James W. Ward,

391 Sutter Street. The total registration for 1913-14 was 40; graduates, 5. The thirty-third session begins Aug. 11, 1914, and ends April 29, 1915.

COLLEGE OF PHYSICIANS AND SURGEONS, 344 Fourteenth Street.—Organized in 1896. The first class graduated in 1897. The faculty numbers 24. The course covers four years of nine months each. The fees for each of the four years, respectively, are $165, $160, $160 and $185. The Dean is Dr. L. W. Spriggs. Registration for 1913-14 was 34; graduates, 8. The eighteenth session begins Sept. 2, 1914, and ends June 4, 1915.

San Francisco-Palo Alto

LELAND STANFORD JUNIOR UNIVERSITY, SCHOOL OF MEDICINE, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The faculty consists of 36 professors and 57 lecturers, assistants, etc., a total of 93. Three years of collegiate work are required for admission. The course covers four years of nine months each. Students matriculating in September, 1914, and thereafter will be required to take a five year course including a year of practical or intern work prior to graduation. The total fees for the first are $160; for the second, $155 and for the third and fourth years, $150 each. The Dean is Dr. R. L. Wilbur, San Francisco. The total registration for 1913-14 was 75; graduates, 13. The fifth session begins Sept. 2, 1914, and ends May 17, 1915.

COLORADO

Colorado, with a population of 799,024, has one medical college, the University of Colorado School of Medicine. The first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 213,381.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination granted by any other licensing board. The law permits any one, graduate or non-graduate, to try the Board's written examination. No graduate of 1914 or thereafter is eligible to obtain a license in Colorado on indorsement of his credentials unless he graduated from a medical college which at the time he matriculated required at least *two years'* study without conditions in an accredited college of liberal arts which work must have included courses in physics, chemistry, biology and one modern language.

Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911, when the legal right to teach the last two or clinical years in Denver was secured. The faculty embraces 49 professors and 24 lecturers and assistants, a total of 73. The work embraces a graded course of four years of nine months each. The entrance requirements are *two years* of college work counting toward a degree in arts in an accredited college or university. The tuition is $75 per year; there are no other fees. The Dean is Dr. William P. Harlow. The total registration for 1913-14 was 54; graduates, 17. The thirty-third session begins Sept. 14, 1914, and ends June 9, 1915.

CONNECTICUT

Connecticut, with a population of 1,114,756 has one medical college, located in New Haven, population 133,605.

Candidates for license to practice medicine in Connecticut, who graduate in 1914 or thereafter are not eligible unless, prior to entering on the study of medicine they had completed, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

YALE MEDICAL SCHOOL, York and Chapel Streets.—This is the Department of Medicine of Yale University. In 1810 a charter was granted for the establishment of this school, and in 1813 it was organized as the Medical Institution of Yale College. The first class graduated in 1814. The faculty consists of 16 professors and 50 lecturers and assistants, a total of 66. The requirement for admission is *two full years* of collegiate work plus evidence of satisfactory preparation in physics, general inorganic chemistry and general biology. The course covers four years of nine months each. The fees for the four years, respectively, are approximately $223, $170, $153 and $163. The Dean is Dr. George Blumer. The total registration for 1913-14 was 49; graduates, 8. The one hundred and second session begins Oct. 1, 1914, and ends June 23, 1915.

DISTRICT OF COLUMBIA

Washington, population 331,069, has three medical colleges; George Washington University Medical School, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1325 H Street, N.-W.—Organized in 1825 as the National Medical College, Medical Department of Columbian College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 22 professors and 51 instructors, demonstrators and assistants, a total of 73. One year of collegiate work is required for admission. The course covers four years of thirty-two weeks each. The total fees are $150 per year. The Dean is Dr. William C. Borden. The total registration for 1913-14 was 171; graduates, 16. The ninety-third session begins Sept. 30, 1914, and ends June 9, 1915.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 33 professors, 54 instructors and assistants; total, 87. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one-half months each. The fees for the first year are $165, and for each of the other three years, $150. The Dean is Dr. George M. Kober. The registration for 1913-14 was 99; graduates, 21. The sixty-fourth session begins Sept. 25, 1914, and ends June 13, 1915.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 19 professors and 20 lecturers and assistants, 39 in all. The admission requirements are one year of collegiate work including physics, chemistry, botany and zoology and a reading knowledge of one modern language besides English. The course covers four years of thirty-two weeks each. The fees of each of the four sessions, respectively, are $107, $102, $102 and $109. The Dean is Dr. Edward A. Balloch. Registration for 1913-14 was 110; graduates, 32. The forty-seventh session begins Oct. 1, 1914, and ends June 2, 1915.

GEORGIA

Georgia, population 2,609,121, has two medical colleges; University of Georgia, Medical Department, located in Augusta, population 41,040 and the Atlanta Medical College, in Atlanta, a city of 154,839 population.

Atlanta

ATLANTA MEDICAL COLLEGE.—Butler and Armstrong Streets.—Organized in 1854. Classes graduated, 1855 to 1861, when it suspended. Reorganized in 1865. In 1898 it merged with the Southern Medical College (organized in 1878) taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming its first title. One year of collegiate work is required for entrance. It has a faculty of 34 professors and 78 instructors, assistants, etc., a total of 113. The course of study is four years of thirty-two weeks each. The fees are $150 each year. The Dean is Dr. W. S. Elkin. Total registration for 1913-14 was 488; graduates, 125. The next session begins Sept. 28, 1914, and ends June 1, 1915.

Augusta

UNIVERSITY OF GEORGIA, MEDICAL DEPARTMENT, Railroad Avenue and Harper Street.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the University in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 20 professors and 27 assistants, 47 in all. One year of collegiate work is required for entrance. The course is four years of thirty-four weeks each. Fees are $150 each year. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1913-14 was 58, graduates, 20. The eighty-third session begins Sept. 16, 1914, and ends June 1, 1915.

ILLINOIS

Illinois, population 5,638,591, has eight medical colleges, two of which give instruction at night, all located in Chicago, a city of 2,185,283 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Hahnemann Medical College and Hospital, Bennett Medical College, Chicago College of Medicine and Surgery, Jenner Medical College and the Chicago Hospital College of Medicine.

To be eligible for license to practice medicine in Illinois, students matriculating in the session of 1914-15 and thereafter, in addition to an accredited four-year high school education, must have completed at least a year of collegiate work including courses in physics, chemistry, biology and a modern language, to be taken either in a preliminary year given by a recognized medical college, or in an approved college of liberal arts.

Chicago

RUSH MEDICAL COLLEGE.—This school was founded in 1837, organized in 1843, was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 100 professors, 188 associates, instructors, etc., a total of 288. The requirements for admission are *two years* of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The course covers four years of eight and a half months each. A fifth year, consisting of a hospital internship or of a fellowship in one of the departments, will be required of all students matriculating for the summer quarter of 1914 and thereafter. All freshmen and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The total fees are $180 each year. A matriculation fee of $5 is paid but once, and there are incidentals amounting from $2 to $5 annually. The

Dean is Dr. John M. Dodson. Total registration 1913-14 was 462; graduates, 97. The seventy-second session begins Oct. 1, 1914, and ends June 19, 1915.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, South Dearborn Street, between Twenty-Fourth and Twenty-Fifth Streets.—Organized in 1859 as the Medical Department of Lind University. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. The faculty comprises 58 professors and 80 lecturers and assistants, a total of 138. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University plus *two years* of college work including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are $190, $195, $190 and $206. The Dean is Dr. Arthur R. Edwards. The total registration for 1913-14 was 180; graduates, 69. The fifty-fifth session begins Sept. 29, 1914, and ends June 6, 1915.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Honore and Congress Streets.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1896 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913. The American Medical Missionary College was absorbed in 1910. *Two years* of collegiate work are required for admission. The faculty is composed of 60 professors, 89 assistants and instructors, a total of 149. The fees are $155 each year. The Dean is Dr. D. A. K. Steele. Total registration for 1913-14 was 422; graduates, 113. The thirty-third session begins Oct. 1, 1914, and ends June 11, 1915.

CHICAGO COLLEGE OF MEDICINE AND SURGERY, 706 South Lincoln Street.—Organized in 1901 as the American College of Medicine and Surgery (Chicago Eclectic Medical College). The latter part of the name was dropped in 1902 and it became the Medical Department of Valparaiso University. Eclecticism was dropped in 1905. The name was changed to the above in 1907. One year of collegiate work, including courses in physics, chemistry, biology and a modern language is required for admission. The course covers four years of eight months each. The faculty numbers 114. The total fees of each of the four years are $150. The Dean is Dr. W. J. Butler. The total registration for 1913-14 was 638; graduates 177. The fourteenth session begins Sept. 29, 1914, and ends May 24, 1915.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. The faculty includes 32 professors and 46 lecturers, assistants, etc., a total of 78. One year of collegiate work, including courses in physics, chemistry and biology and a modern language is required for admission. The course extends over four years of eight months each. The tuition fees for the four years, respectively, are $146, $131.50, $165 and $186.50. The Dean is Dr. Joseph P. Cobb. The total registration for 1913-14 was 92; graduates, 17. The fifty-fifth session begins Sept. 28, 1914, and ends May 27, 1915.

BENNETT MEDICAL COLLEGE, Fulton and Ada Streets.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Dropped Eclecticism in 1909. In 1910 it united with the Illinois Medical College and became by affiliation the Medical Department of Loyola University. The first class graduated in 1870. The faculty numbers 68. The course covers five years of thirty-two weeks each. The fees are $150 each year. The Dean is Dr. Maximilian Herzog. The total registration for 1913-14 was 406; graduates, 111. The next session begins Sept. 30, 1914, and ends May 28, 1915.

JENNER MEDICAL COLLEGE, an afternoon and night school, located at 701 South Wood Street.—Organized in 1892. Classes were graduated in 1896 and in all subsequent years. The faculty numbers 48. The Secretary is Dr. John D. MacKellar. Total registration for 1913-14 was 199; graduates, 11. The next session begins Sept 1, 1914, and ends June 13, 1915. *Reported not recognized by the licensing boards of thirty-one states.*

CHICAGO HOSPITAL COLLEGE OF MEDICINE, another afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1913. Claimed to have had a registration of 75 in 1913-14. There was 1 graduate. *Official reports indicate that the diplomas from this college are not recognized by the licensing boards of thirty-one states.*

INDIANA

Indiana, population 2,700,876, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 233,650 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Candidates for license to practice medicine in Indiana who matriculated between Jan. 11, 1910 and Jan. 11, 1914, must have completed one year of collegiate work in addition to an accredited four-year high school course prior to beginning the study of medicine. Those matriculating subsequent to Jan. 11, 1914, must have completed *two years* of work in a recognized college of liberal arts. This additional preliminary work must have included college courses in physics, chemistry and biology.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907 by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1869), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879) merged into it. The first class was graduated in 1908. The faculty consists of 72 professors and 58 lecturers, associates and assistants, a total of 130. *Two years* of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees for the four years, respectively, are $100, $100, $130 and $130. A fifth optional year leading to the "M.D. cum laude" has been added. The Secretary at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1913-14 was 133; graduates, 22. The next session begins Sept. 29, 1914, and ends June 23, 1915.

IOWA

Iowa, population 2,224,771, has two medical colleges. The College of Medicine and the College of Homeopathic Medicine of the State University of Iowa, both located in Iowa City, population 10,091.

Candidates for license to practice medicine in Iowa who graduated subsequent to Jan. 1, 1911, must have completed *two years* of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry and biology.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 21 professors, 21 lecturers, demonstrators and assistants, a total of 42. *Two years* of collegiate work, including courses in physics, chemistry, biology and French or German, are required for admission. The course of study covers four years of thirty-six weeks each. Total fees for each of the four years, respectively, are $110, $100, $100 and $110. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1913-14 was 108; graduates, 13. The forty-fifth session begins Sept. 21, 1914, and ends June 16, 1915.

STATE UNIVERSITY OF IOWA COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1877. The first class graduated in 1878. The faculty is composed of 15 professors and 15 lecturers and assistants, a total of 30. The work of the first two years is taken in classes with the students of the College of Medicine of the State University of Iowa, and it has the same entrance requirements. The fees are $100 each year, plus a matriculation fee of $10, paid but once, and a graduation fee of $10. The Dean is Dr. George Royal. Total registration for 1913-14 was 5; no graduates. The thirty-seventh session begins Sept. 21, 1914, and ends June 16, 1915.

KANSAS

Population 1,690,949, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,915, and the last two years in Rosedale, a suburb of the two Kansas Cities, which together have a population of 330,662.

Candidates for license to practice medicine in Kansas who matriculated in the session of 1910-11 and thereafter must present credentials showing that he matriculated in and graduated from a medical college which required for admission at least one year of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course. This applies to all graduates of 1914 and thereafter.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. In 1905 it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 58. The requirements for admission are *two years* of collegiate work. The course covers four years of nine months each. The total fees are for each of the first two years, $30 per year (and for non-residents of the state, $45); for the last two years $100 and $105, respectively. The Dean is Dr. S. J. Crumbine; Associate Dean, Dr. M. T. Sudler. The total registration for 1913-14 was 105; graduates, 10. The thirty-fifth session begins Sept. 16, 1914, and ends June 10, 1915.

KENTUCKY

Kentucky, population 2,289,905, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 223,928 inhabitants.

To be eligible for license to practice medicine in Kentucky all students matriculating in and after the session of 1914-15 must have completed, in addition to an accredited four-year high school course, at least one year's work in an approved college of liberal arts including college courses in physics, chemistry, biology and a modern language.

Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the hospital College of Medicine and the Kentucky School of Medicine. One year of collegiate work is required for admission. It has a faculty of 35 professors and 58 lecturers and assistants, a total of 93. The course covers four years of thirty-two weeks each. The fees are $165 each year; graduation fee $10. The Dean is Dr. Henry Enos Tuley. The total registration for 1913-14 was 278, graduates, 54. The next session begins Sept. 28, 1914, and ends June 3, 1915.

LOUISIANA

Louisiana, having a population of 1,656,388, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 339,075.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years, except 1863-65, inclusive. It was transferred to Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University in 1884. Present name in 1913 when it became the School of Medicine of the College of Medicine of the Tulane University. The faculty has 29 professors and 86 instructors, demonstrators, etc., a total of 115. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission. Total fees are $195 per year; graduation fee, $30. The Dean is Dr. Isadore Dyer. The total registration for 1913-14 was 327; graduates, 77. The eighty-first session begins Sept. 28, 1914, and ends June 2, 1915.

MAINE

Maine, population 742,371, has one medical college, located in Brunswick and Portland, the latter having a population of 58,571.

Brunswick-Portland

MEDICAL SCHOOL OF MAINE. The medical department of Bowdoin College. The first two years are given at Bowdoin College, Brunswick, the last two at Portland, building located on Chadwick Street.—Organized in 1820. The first class graduated in 1820. The faculty numbers 66. The course covers four years of eight months each. The total fees are $110 for each of the first three years and $135 for the fourth. The Dean is Dr. Addison S. Thayer, 10 Deering Street, Portland. The total number of students in 1913-14 was 67; graduates, 19. The ninety-fourth session begins Oct. 15, 1914, and ends June 24, 1915.

MARYLAND

Maryland, with a population of 1,295,346, contains three medical colleges, all located in Baltimore, a city with 558,485 inhabitants. They are as follows: Johns Hopkins University Medical Department, School of Medicine of the University of Maryland and the College of Physicians and Surgeons.

Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 37 professors and 90 clinical professors, etc., a total of 127. The requirements for admission demand that the applicant either has (a) completed the chemical-biologic course which leads to the A.B. degree in the university or (b) graduated at an approved college or scientific school and has a knowledge of French and German, physics, chemistry and biology, such as may be obtained from a year's course. The course extends over four years of eight and one-half months each. The charge for tuition is $240 for the first year and $200 for each of the other three years. The Dean is Dr. J. Whitridge Williams. Total registration for 1913-14 was 360; graduates, 91. The twenty-second session begins Oct. 6, 1914, and ends June 8, 1915.

COLLEGE OF PHYSICIANS AND SURGEONS, Calvert and Saratoga Streets.—Organized in 1872. The first class graduated in 1873. In 1878 it united with Washington University School of Medicine. The faculty consists of 19 professors and 50 lecturers, demonstrators, etc., a total of 69. A year of collegiate work is required for admission. The work covers four years of eight months each. Total fees are $165 each year; graduation fee $30. The dean is Dr. William F. Lockwood. The total number of students registered in 1913-14 was 184; graduates, 58. The forty-third session begins Oct. 1, 1914, and ends June 1, 1915.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE, Lombard and Greene Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. The faculty numbers 139. A year of collegiate work is required for admission. The course covers four years of eight months each. The total fees are $170 each year; graduation fee, $30. The Dean is Dr. R. Dorsey Coale. The total number of students registered in 1913-14 was 454; graduates, 97. The one hundred and eighth session begins Oct. 1, 1914, and ends June 1, 1915.

MASSACHUSETTS

Massachusetts, population 3,366,416, has four medical colleges: Medical School of Harvard University, Boston University School of Medicine, College of Physicians and Surgeons and Tufts College Medical School. They are all situated in Boston, a city of 670,585.

Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 58 professors and 149 associates, assistants, etc., a total of 207. Candidates for admission must present either a recognized college degree with courses in inorganic and organic chemistry or credits for *two years* of work in a recognized college or scientific school, which must include courses in physics, inorganic and organic chemistry and biology. The session is four years of eight months each. The total fee for each is $225. The Dean is Dr. Edward H. Bradford. The total registration for 1913-14 was 305; graduates, 64. The one hundred and thirty-third session begins Sept. 28, 1914, and ends June 24, 1915.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. One year of collegiate work is required for admission. The faculty includes 33 professors, 35 associates, etc., a total of 68. The course covers four years of eight months each. Total fees for each of the four years, respectively, are $152, $147, $127 and $155. The Dean is Dr. John P. Sutherland. Total registration for 1913-14 was 113; graduates, 22. The forty-second session begins Oct. 1, 1914, and ends June 2, 1915.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 42 professors and 80 assistants, lecturers, etc., a total of 122. One year of collegiate work is required for admission. The course covers four years of eight months each. The total fees are $155 each year. The Dean is Dr. Charles F. Painter. Total registration for 1913-14 was 311; graduates, 62. The twenty-first session begins Sept. 30, 1914, and ends June 1, 1915.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. The college announcement gives the names of 228 "matriculants and applicants" for the session of 1913-14, which included both dental and medical students. Fairly reliable information, however, shows that the total attendance of medical students during 1913-14 was 110. There were 13 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of thirty-one states.*

MICHIGAN

Michigan, population 2,810,173, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic Medical College of the University of Michigan, are located at Ann Arbor, a city of 14,817 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 465,766 inhabitants.

To be eligible for license to practice medicine in Michigan, all students matriculating in and after the session of 1914-15, in addition to an accredited four-year high school education, must have completed at least one year's work in an approved college of liberal arts including college courses in physics, chemistry and biology, prior to beginning the study of medicine.

Ann Arbor

UNIVERSITY OF MICHIGAN DEPARTMENT OF MEDICINE AND SURGERY.—Organized in 1850. The first class graduated in 1851. It has a faculty composed of 19 professors and 56 associates, instructors, etc., a total of 75. The entrance requirements are *two years* of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students for the entire course of four years is $350 and for others about $400. The Dean is Dr. Victor C. Vaughan. The total registration for 1913-14 was 282; graduates, 36. The sixty-fifth session begins Sept. 29, 1914, and ends June 24, 1915.

UNIVERSITY OF MICHIGAN HOMEOPATHIC MEDICAL COLLEGE.—Organized in 1875. The first class graduated in 1877. Although the work of the first two years is taken in the same classes with the Department of Medicine and Surgery of the University of Michigan, nevertheless the entrance requirements have been kept at one year of collegiate work; the requirement for the other department is two years of collegiate work. The Dean is Dr. W. B. Hinsdale. The total registration for 1913-14 was 73; graduates, 22. The next session begins Sept. 29, 1914, and ends June 24, 1915.

Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, St. Antoine and Mullett Streets.—Organized in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. Entrance requirements are one year of collegiate work. The faculty embraces 23 professors, 146 lecturers, instructors, etc., a total of 169. The course covers four years of eight months each. The Secretary is Dr. F. B. Walker. The total registration for 1913-14 was 249; graduates, 54. The thirtieth session begins Sept. 21, 1914, and ends June 3, 1915.

MINNESOTA

Minnesota, population 2,075,708, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis. Minneapolis and St. Paul are practically one city, and have a combined population of 516,162.

Candidates for license to practice medicine in Minnesota who graduated subsequent to June 1, 1912, in addition to an accredited four-year high school education must have completed *two years* of work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883; reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital Medical College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. The faculty includes 11 professors and 37 associate and assistant professors and 70 instructors and assistants, a total of 118. The curriculum covers four years of nine months each and a

year's internship in an approved hospital. The entrance requirements are *two years* of university work which must include one year each of physics, general chemistry, qualitative analysis, zoology or botany, and French or German, all in addition to a four-year high school course, including two years of Latin. Students entering hereafter will be required to secure a degree of B.S. or A.B. before the M.D. is granted. Total fees are $150 each year. The Dean is Dr. E. P. Lyon. The total registration for 1913-14 was 169; graduates, 30. The twenty-seventh session begins Sept. 16, 1914, and ends June 11, 1915.

MISSISSIPPI

Mississippi, population 1,797,114, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 1,825 inhabitants.

Oxford

UNIVERSITY OF MISSISSIPPI DEPARTMENT OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. The session extends over eight and a half months. Entrance requirements are one year of collegiate work in addition to an accredited four-year high school education. The total fees each year are, respectively, $102 and $100. The faculty numbers 14. The Dean is Dr. W. S. Leathers. The total registration for 1913-14 was 35. The twelfth session begins Sept. 17, 1914, and ends June 1, 1915.

MISSOURI

Missouri, population 3,293,335, has seven medical colleges. St. Louis, population 687,029, contains four of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, St. Louis College of Physicians and Surgeons and the American Medical College. Kansas City, which with Kansas City, Kan., has a total population of 330,662, has two colleges, namely: the Kansas City Hahnemann Medical College and the Eclectic Medical University. The School of Medicine of the University of Missouri is at Columbia, a town of 9,662 people.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1859, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 9 professors and 6 assistant professors, lecturers, etc., a total of 15. The course covers two years of nine months each. The entrance requirements are *two years* of college work including English, 5 hours; German, 5 hours; general zoology, 5 hours; physics, 5 hours; inorganic chemistry, 5 hours; elective, 35 hours. Equivalent work in foreign language may be substituted for the English and German. Total fees are $40 each year. The acting Dean is Dr. Guy L. Noyes. Total registration of students for 1913-14 was 55. The next session begins Sept. 14, 1914, and ends June 3, 1915.

Kansas City

KANSAS CITY HAHNEMANN MEDICAL COLLEGE, 916 Tracy Avenue.—Organized in 1888 as the Kansas City Homeopathic Medical College. The first class graduated in 1899. In 1902 it united with the Hahnemann Medical College of Kansas City University, taking the present title. The faculty numbers 40. The fees are $125 each year. The Registrar is Dr. Sam H. Snow. Total registration for 1913-14 was 46; graduates, 13. The next session begins Sept. 8, 1914, and ends May 20, 1915.

ECLECTIC MEDICAL UNIVERSITY, 1423 Independence Avenue.—Organized at Kansas City, Mo., in 1898 with the present title. Moved to Kansas City, Kan., in 1907, and took the name of Western Eclectic College of Medicine and Surgery. Returned to Kansas City, Mo., in 1909 and resumed the present title. First class graduated in 1900. The total registration for 1913-14 was 65; graduates 14. *Reported not in good standing by the Missouri State Board of Health and by twenty-eight other state licensing boards.*

St. Louis

WASHINGTON UNIVERSITY MEDICAL SCHOOL, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Washington University Medical School. In 1899 it absorbed the Missouri Medical College. The faculty comprises 23 professors and 56 lecturers, instructors, etc., a total of 79. *Two full years* of college work are required for admission including courses in English, physics, chemistry and biology and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, $155, $150, $150 and $155. The Dean is Dr. Eugene L. Opie. The total registration for 1913-14 was 67; graduates, 15. The next session begins Sept. 24, 1914, and ends June 10, 1915.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 53 professors, 69 lecturers and assistants, a total of 122. One year of college subjects preliminary to the four years of medical subjects is given in the medical school. The curriculum covers four years of thirty-four weeks each. The total fees are $140 each year. The total registration for 1913-14 was 204; graduates, 45. The Dean is Dr. Hanau W. Loeb. The next session begins Sept. 15, 1914, and ends May 17, 1915.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson Avenue and Gamble Street.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. It was reorganized in 1879. Classes graduated in 1880 and subsequent years. Total registration for 1913-14 was 48; graduates, 24.

AMERICAN MEDICAL COLLEGE, Garrison and Lawton Avenues.—Organized in 1873 as an Eclectic College. Eclecticism dropped in 1910. Absorbed the Barnes Medical College in 1911. Became the Medical Department of the National University of Arts and Sciences in 1912. Two classes were graduated each year from 1874 to 1883, inclusive. Since then one class has graduated each year. The course covers four years of eight and a half months each. Beginning with the session of 1914-15 a five-year course will be required including a preliminary year in physics, chemistry and biology. Fees: matriculation, $5; tuition each year, $135. The Dean is Dr. James Moores Ball. The total registration for 1913-14 was 146; graduates, 34. The next session begins Sept. 22, 1914, and ends June 7, 1915.

NEBRASKA

Nebraska, population 1,192,214, has three medical colleges. The University of Nebraska College of Medicine and the John A. Creighton Medical College of Omaha, population 124,096, and the Cotner University Medical College at Lincoln, population 43,973.

Bethany-Lincoln

COTNER UNIVERSITY MEDICAL COLLEGE. Eclectic. University Campus Bethany, and corner Thirteenth and P Streets, Lincoln. It is the Medical Department of Cotner University.—Organized in 1890 as the Lincoln Medical College. Assumed present title in 1911. The first class graduated in 1891. The faculty numbers 33. The fees are $100 each year. The Registrar is Prof. R. L. Hoff, Lincoln. The total registration for 1913-14 was 29; graduates, 5. The next session begins Sept. 14, 1914, and ends May 27, 1915.

Omaha

JOHN A. CREIGHTON MEDICAL COLLEGE, Fourteenth and Davenport Streets. It is the Medical Department of Creighton University.—Organized in 1892. The first class graduated in 1895. It has a faculty of 15 professors and 38 associates, lecturers and assistants, a total of 53. One year of collegiate work is required for admission. The course of study embraces four years of eight months each. The total fees for the four years, respectively, are $130, $120, $120 and $120. The Dean is Dr. A. L. Muirhead. Total registration for 1913-14 was 182; graduates, 35. The twenty-third session begins Sept. 1, 1914, and ends April 30, 1915.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha university in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913 when all four years were transferred to Omaha. The faculty is composed of 31 professors and 27 lecturers and instructors, total 58. *Two years* of collegiate work are required for admission including courses in physics, chemistry, zoology and German. The fees are approximately $100 per annum. The Secretary is Dr. Irving S. Cutter. Total registration for 1913-14 was 84; graduates, 11. The next session begins Sept. 14, 1914, and ends June 4, 1915.

NEW HAMPSHIRE

New Hampshire, population 443,140 has one medical college, located at Hanover, population 1,884.

Only graduates of medical colleges registered by the Regents of New Hampshire are eligible to obtain licenses to practice medicine. Medical colleges to be registered, for all students matriculating in the session of 1914-15 and thereafter, must require for admission at least one year of collegiate work, including college courses in physics, chemistry and biology in addition to a standard four-year high school education.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 19 professors and 7 instructors, a total of 26. *Two years* of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the B.S. degree in Dartmouth College may substitute the work of the first two years in medicine for that of the junior and senior years in the academic department. Candidates for the A.B. degree may make a similar saving of one year. The fees for the two years in medicine are, respectively, $169.50 and $173.50. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The next session opens September 24, 1914, and ends June 24, 1915.

NEW YORK

New York State, population 9,113,614, has ten medical colleges. Seven of these, College of Physicians and Surgeons (Columbia University), Long Island College Hospital, New York Homeopathic Medical College and Hospital, New York Medical College and Hospital for Women, Cornell University Medical College, the University and Bellevue Hospital Medical College and Fordham University School of Medicine, are located in New York City, population 4,766,883. Albany Medical College is located in Albany, a city of 100,253 people. The University of Buffalo Medical Department is situated in Buffalo, population 423,715. The College of Medicine, Syracuse University, is in Syracuse, a city of 137,249 inhabitants.

Albany

ALBANY MEDICAL COLLEGE, Lancaster and Jay Streets.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. The faculty is composed of 18 professors and 85 lecturers, assistants, etc., a total of 103. One year of collegiate work, including college courses in physics, chemistry and

biology are required for admission. The curriculum covers four years of eight months each. The fees for each of the four years are, respectively, $135, $140, $120 and $130. The Registrar is Dr. Joseph D. Craig. The total registration for 1913-14 was 258; graduates 52. The eighty-fourth session begins Sept. 22, 1914, and ends May 25, 1915.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT. High Street, near Main.—Organized in 1846. The first class graduated in 1874. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 33 professors and 67 lecturers, assistants, etc., a total of 100. One year of collegiate work, including college courses in physics, chemistry and biology are required for admission. The course covers four years of eight months each. The total fees for the four years, respectively, are $185, $180, $140 and $140. The Dean is Dr. Herbert U. Williams. Total registration for 1913-14 was 236; graduates, 47. The sixty-ninth session begins Sept. 21, 1914, and ends June 4, 1915.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. Affiliated with Columbia College in 1814 and was permanently connected in 1860, when it became the Medical Department of Columbia College. That institution became Columbia University in 1891. The faculty is composed of 76 professors and 133 instructors, demonstrators, etc., a total of 209. *Two years* of collegiate work, including courses in physics, chemistry and biology are required for admission. The work covers four years of eight months each. The Dean is Dr. Samuel W. Lambert. The total fees for the first year are $255; for the second and third, $250, and $275 for the fourth year. Total registration for 1913-14 was 308; graduates, 71. The one hundred and seventh session begins Sept. 23, 1914, and ends June 2, 1915.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 38 professors and 99 assistants, lecturers, instructors, etc., a total of 137. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, $190, $185, $185 and $200. The Dean is Dr. William M. Polk. Total registration for 1913-14 was 108; graduates, 20. The seventeenth session begins Sept. 30, 1914, and ends June 10, 1915.

FORDHAM UNIVERSITY SCHOOL OF MEDICINE, Bathgate Avenue and Fordham Road.—Organized in 1905. First class graduated in 1909. The faculty consists of 49 professors and 50 lecturers and assistants, a total of 99. The course of instruction covers four years of eight and a half months each. Fees, $200 each year. A year's work in a recognized college of liberal arts, including college courses in physics, chemistry and biology, is required for admission. The Dean is Dr. William P. Healy. The total registration for 1913-14 was 175, graduates, 29. The tenth session begins Sept. 25, 1914, and ends June 8, 1915.

LONG ISLAND COLLEGE HOSPITAL, Henry Street, near Atlantic Avenue, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 39 professors and 74 assistants, instructors, etc., a total of 113. A year of collegiate work including college courses in physics, chemistry and biology is required for admission. The course covers four years of eight months each. Fees: First year, $210, second year, $205, third, $200, and $200 for the fourth year. The Secretary is Dr. Joseph H. Raymond. Total registration 1913-14 was 360, graduates, 79. The fifty-seventh session begins Sept. 22, 1914, and ends June 7, 1915.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College for the State of New York. The present title was assumed in 1869. The first class graduated in 1861. The faculty consists of 27 professors and 44 assistants, lecturers, etc., a total of 71. The total fees for each of the four years respectively are $165, $160, $150 and $180. The Dean is Dr. Royal S. Copeland. Total registration for 1913-14 was 237, graduates, 43. The fifty-fifth session begins Sept. 30, 1914, and ends May 26, 1915.

NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN (Homeopathic) 17-19 West One Hundred and First Street.—Organized in 1863. The first class graduated in 1864. The faculty consists of 30 professors and 28 lecturers and assistants, a total of 58. The course covers four years of thirty weeks each. The fees for each of the four years, respectively, are $155, $150, $135 and $155. The Dean is Dr. Cornelia C. Brant. The total registration for 1913-14 was 42, graduates, 7. Matriculants are not listed in the annual announcement. The fifty-second session begins Sept. 23, 1914, and ends June 3, 1915.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, First Avenue and Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. The faculty is composed of 69 professors and 56 instructors, etc., in all 125. The course covers four years of eight months each. Entrance requirements are one year of collegiate work, in addition to a standard four-year high school course, including college courses in physics, chemistry and biology. The fees are $200 per year; graduation fee, $25. The Secretary is Dr. Samuel A. Brown. Total registration for 1913-14 was 333, graduates, 83. The next session begins Sept. 23, 1914, and ends June 9, 1915.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875. The first class graduated in 1873 and a class graduated each subsequent year. In 1884 the amalgamation with the university was made complete. Two years of a recognized college course are required for admission. The course covers four years of thirty-five weeks each. The total fees for each of the four years are respectively, $192, $187, $187 and $207. The faculty is composed of 23 professors and 50 associate and assistant professors, lecturers and instructors. The Dean is Dr. John L. Heffron. The total enrollment for 1913-14 was 96; graduates, 16. The forty-third session begins Sept. 15, 1914, and ends June 9, 1915.

NORTH CAROLINA

North Carolina, population 2,206,287, has three medical schools, all of which give only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,200. The Leonard Medical School is at Raleigh, population 19,218. Wake Forest College School of Medicine is at Wake Forest, population 823.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. One year of collegiate work is required for admission. The faculty is composed of 12 professors and 13 lecturers, assistants, etc., a total of 25. The total fees for the two years, respectively, are $120 and $125. The Dean is Dr. I. H. Manning. The total registration for 1913-14 was 60. The twenty-ninth session begins Sept. 10, 1914, and ends June 2, 1915.

Raleigh

LEONARD MEDICAL SCHOOL.—Colored. This department of Shaw University was established in 1882. Classes were graduated in 1886, 1888 and in all subsequent years, including 1914 when clinical teaching was discontinued. A year of collegiate work is required for admission. It has a faculty of 14. The course covers four years of seven and a half months each. The total fees for each year are $57; graduation fee, $10. The Dean is Dr. George H. Stoddard. Total registration for 1913-14 was 78; graduates 8. The thirty-third session begins Sept. 30, 1914, and ends May 13, 1915.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics, and biology numbers 10, exclusive of laboratory assistants. Only the first two years of the medical course are offered after the completion of freshmen and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate $103. The Secretary is E. B. Earnshaw. The total registration for 1913-14 was 28. The thirteenth session begins Sept. 1, 1914, and ends May 21, 1915.

NORTH DAKOTA

North Dakota, population 577,056, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, near Grand Forks, a city of 12,478 people. It gives only the first two years of the medical course.

Candidates for license to practice medicine in North Dakota who graduated in 1912 and thereafter, in addition to a four-year high school education must have completed *two years* of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. The faculty is composed of 5 professors and 12 instructors, a total of 17. The course consists of *two years'* academic work and two years of medical college subjects, occupying nine months each year. The total fee for each of the medical years is $50. The Dean is Dr. H. E. French. The total registration for 1913-14 was 14. The tenth session begins Sept. 22, 1914, and ends June 16, 1915.

OHIO

Ohio, population 4,767,121, has five medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 364,463 inhabitants. Cleveland, population 560,663, contains one medical school, Western Reserve University School of Medicine. Columbus, population 181,548, contains one medical college, the Ohio State University College of Medicine.

Cincinnati

THE MEDICAL COLLEGE OF THE UNIVERSITY OF CINCINNATI, Clifton Avenue, west of Vine Street.—Organized in 1909 by the union of the Ohio Medical College (founded in 1819) with the Miami Medical College (founded in 1852). The Ohio Medical College became the Medical Department of the University of Cincinnati, April 26, 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. The faculty consists of 37 professors, 100 associates, assistants, etc., a total of 137. *Two years* of college work are required for admission. The course covers four years of eight months each. The fees are a tuition fee of $150 a year; a matriculation fee of $5, payable but once, and a graduation fee of $25. The Dean is Dr. Christian R. Holmes. The total registration for 1913-14 was 60; graduates, 14. The next session begins Sept. 29, 1914, and ends June 12, 1915.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 23 professors and 12 lecturers and assistants, a total of 35. The course covers four years of eight months each. The fees are $120 for each year. The Secretary is Dr. John K. Scudder. Total registration for 1913-14 was 87; graduates, 19. The next session begins Sept. 10, 1914, and ends May 10, 1915.

Cleveland

CLEVELAND-PULTE MEDICAL COLLEGE, Prospect Avenue and Huron Road.—Homeopathic.—Organized in 1849 as the Western College of Homeopathic Medicine. The first class graduated in 1853. In 1857 it became the Western Homeopathic College and in 1870 it became the Homeopathic Hospital College when the Homeopathic Medical College for Women, organized in 1868, merged into it. In 1894 it became the Cleveland University of Medicine and Surgery. In 1898 it merged with the Cleveland Medical College, organized in 1890, and assumed the title of Cleveland Homeopathic Medical College. In 1910 Pulte Medical College of Cincinnati merged into it and the present title was assumed. Total registration for 1913-14 was 53; graduates, 11. It is reported that this college has been transferred to the Ohio State University at Columbus where the establishing of a homeopathic college is contemplated.

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1355 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 it absorbed the Cleveland College of Physicians and Surgeons. The faculty includes 44 professors and 53 lecturers, assistants, etc., a total of 97. The curriculum embraces four years of eight and one-half months each. Three years of college work are required for admission. The total fees for each of the four years are, respectively, $162, $153, $150 and $155. The Secretary is Dr. F. C. Waite. The total registration for 1913-14 was 157; graduates, 34. The seventy-second session begins Oct. 1, 1914, and ends June 17, 1915.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE.—Buttles Avenue and Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1834) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 38 professors and 38 lecturers, demonstrators, etc., a total of 76. One year of collegiate work is required for admission. Beginning with the session of 1915-16, *two years* of collegiate work will be required. The course covers four years of eight months each. Matriculation, $5; tuition of $150 each year. The Dean is Dr. W. J. Means. The total registration for 1913-14 was 284; graduates 54. The next session begins Sept. 16, 1914, and ends June 1, 1915.

OKLAHOMA

Oklahoma, population 1,657,155, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given in the academic laboratories at Norman, a city of 3,040 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 64,205 and which is eighteen miles north of Norman.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 17 professors and 73 instructors, a total of 90. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S. and M.D. The total fees for the four years are, respectively, $55, $28, $100 and $105. The Dean is Dr. Curtis R. Day, 317 East Fourth Street, Oklahoma City. The total registration for 1913-14 was 94; graduates, 14. The fifteenth session begins Sept. 22, 1914, and ends June 10, 1915.

OREGON

Oregon, population 672,765, has one medical college, the University of Oregon Department of Medicine located in Portland, a city of 207,214 population.

Portland

UNIVERSITY OF OREGON DEPARTMENT OF MEDICINE, Lovejoy and Twenty-Third Streets.—Organized in 1887. The first class graduated in 1888. The Willamette University Medical Department was merged in 1913. It has a faculty of 19 professors and 43 lecturers, assistants, etc., a total of 62. Entrance requirements are one year of college work or its equivalent. The course is four years of eight months each. Fees: Matriculation, $5; tuition, $150 each year. The Dean is Dr. K. A. J. Mackenzie. The total registration for 1913-14 was 79; graduates, 26. The twenty-eighth session begins Oct. 1, 1914, and ends June 1, 1915.

PENNSYLVANIA

Pennsylvania, population 7,665,111, has seven medical colleges. Of these Philadelphia, having a population of 1,549,008, contains six, as follows: University of Pennsylvania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania, Medico-Chirurgical College of Philadelphia and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 533,905.

To be eligible for license to practice medicine in Pennsylvania, students matriculating in the session of 1914-15 and thereafter, in addition to a four-year high school education must have completed a year's work either in an approved college of liberal arts or in a preliminary year in the medical college, including college courses in physics, chemistry and biology, before beginning the study of medicine. He must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-79, inclusive. The original title was the Department of Medicine, College of Philadelphia, which was changed to the present title in 1791. It granted the first medical diploma issued in America. The faculty is made up of 35 professors, associate, adjunct and assistant professors and 139 demonstrators, lecturers, associates, instructors, etc., a total of 174. The requirements for admission are the equivalent of work prescribed for the first *two years* in recognized colleges, which work must include a knowledge of physics, chemistry and general biology or zoology and two foreign languages, one of which must be French or German. The course embraces study of four years of thirty-four weeks each. The total fees for each of the four years are, respectively, $229.50, $211.50, $210 and $213. The Dean is Dr. William Pepper. Total registration for 1913-14 was 266; graduates, 74. The one hundred forty-third session begins Sept. 25, 1914, and ends June 16, 1915.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 as the Medical Department of Jefferson College, Cannonsburg. The first class graduated in 1826. The present title was assumed in 1838. It has a faculty of 27 professors and 130 lecturers, demonstrators, etc., a total of 157. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. The course of study covers graded work of four years of eight and a half months each. The tuition is $200 a year, with a matriculation fee of $5, paid but once. The Subdean is Dr. Ross V. Patterson. The total registration for 1913-14 was 648; graduates, 147. The ninetieth session begins Sept. 24, 1914, and ends June 5, 1915.

MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA, Cherry Street, between Seventeenth and Eighteenth Streets.—Organized in 1881. The first class graduated in 1882. The faculty is composed of 45 professors and 69 lecturers, assistants, etc., a total of 114. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. The work embraces four years of eight months each. The fees for each of the four years are, respectively, $162.50, $159, $155.50 and $153. The Dean is Dr. Seneca Egbert. The total registration for 1913-14 was 350; graduates, 75. The thirty-fourth session begins Sept. 21, 1914, and ends June 4, 1915.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue. Organized in 1850. Classes were graduated in 1851 and in all subsequent years except 1861 and 1862. It has a faculty of 11 professors and 50 assistants, lecturers, etc., in all 61. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. Beginning in 1915 this requirement will be further increased to *two years* of collegiate work. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $187, $181, $178.50, $179.50. The Dean is Dr. Clara Marshall. The total registration for 1913-14 was 93; graduates, 18. The sixty-fifth session begins Sept. 16, 1914, and ends June 2, 1915.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, 226 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the present title. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition a preliminary year devoted to college courses in physics, chemistry and biology. It has a faculty of 36 professors and 53 lecturers, instructors, etc., in all 89. The work covers four years of eight and a half months each. Fees: For each year, $180; matriculation, $5; laboratory fee, $10. The Dean is Dr. William A. Pearson. The total registration for the college year 1913-14 was 93; graduates, 14. The sixty-seventh session begins Sept. 21, 1914, and ends June 3, 1915.

THE TEMPLE UNIVERSITY DEPARTMENT OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 97. It gives a five-year day course. The fees are $150 per year. The Dean is Dr. Frank C. Hammond. The total registration for 1913-14 was 101; graduates, 18. The fourteenth session begins Sept. 17, 1914, and ends June 5, 1915.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Grant Boulevard.—Organized in 1886 as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 16 professors and 79 associates, assistants, etc., 95 in all. Entrance requirements are *two years* of recognized college work, to have included essentially courses in chemistry (inorganic and organic), physics, biology and German or French, based on a four-year high school preparation. It is possible for students to get the degree of B.S. and M.D. in six years. The course of study for medicine alone is four years of eight and a half months each. The tuition is $220 a year, $210 if paid in advance. The Dean is Dr. Thomas S. Arbuthnot. The total registration for 1913-14 was 124; graduates, 46. The twenty-ninth session begins Sept. 28, 1914, and ends June 16, 1915.

SOUTH CAROLINA

South Carolina, population 1,515,400, has one medical college, situated in Charleston, a city of 58,833 people.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, Queen and Franklin Streets—Founded in 1823 as the Medical College of South Carolina. In 1832 it was chartered with the present title. Classes were graduated in 1825 and in all subsequent years except 1861 to 1865, inclusive. In 1912 by legislative enactment it became a state institution. It has a faculty of 29 professors and 33 lecturers, instructors, etc., a total of 62. The course covers four years of eight months each. One year of collegiate work including courses in physics, chemistry and biology is required for admission in addition to a standard high school preparation. The total fees are $140 each year. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1913-14 was 104; graduates, 19. The eighty-sixth session begins Oct. 1, 1914, and ends June 3, 1915.

SOUTH DAKOTA

South Dakota, population 583,888, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a city of 2,147 people.

To be eligible for license to practice medicine in South Dakota graduates of 1915 and thereafter must show that they matriculated in and graduated from medical colleges which required at least *two years* of collegiate work for admission, including courses in physics, chemistry, biology and a modern language. This affects all students who matriculated in the session of 1911-12 and thereafter.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. *Two years'* work in a college of liberal arts is required for admission. The fees are $60 each year. The faculty numbers 9. The Dean is Christian P. Lommen, B.S. The total registration for 1913-14 was 14. The eighth session begins Sept. 15, 1914, and ends June 10, 1915.

TENNESSEE

Tennessee, population 2,184,789, has four medical colleges. Of these Vanderbilt University Medical Department and Meharry Medical College are situated in Nashville, a city with a population of 106,476. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 136,363.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue, 880 Monroe Avenue, and 718 Union Avenue.—Organized in 1876 at Nashville as Nashville Medical College. Became Medical Department University of Tennessee 1878. First class graduated 1879 and a class graduated each subsequent year. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The Trustees of the University of Nashville by formal action of that Board named the University of Tennessee College of Medicine as its legal successor in medical teaching, transferring all of its college and hospital equipment to the successor. This college then removed to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Entrance requirements are a completed secondary education plus one year of collegiate work. The fees are $100 per year for bona fide residents of the state and $125 per year for non-residents; graduation fee $25. The Dean is Dr. Herbert Thomas Brooks. Total registration 1913-14, 321; graduates, 77. The next session begins Sept. 22, 1914, and ends June 4, 1915.

UNIVERSITY OF WEST TENNESSEE COLLEGE OF MEDICINE AND SURGERY. Colored. 1190 South Phillips Place.—Organized in 1900. The first class graduated in 1904 and a class graduated each subsequent year. It has a faculty of 21. The course is four years of thirty weeks each. The fees are $55 per year; graduation $10 extra. The Dean is Dr. M. V. Lynk. Registration for 1913-14 was 73; graduates, 25. The fifteenth session begins Sept. 14, 1914, and ends May 1, 1915.

Nashville

VANDERBILT UNIVERSITY MEDICAL DEPARTMENT.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 25 professors and 40 lecturers, a total of 65. One year of collegiate work is required for admission. The course covers four years of nearly eight months each. The total fees for each of the first three years are $150, and for the fourth year, $175. The Acting Dean is Dr. L. E. Burch. The total registration for 1913-14 was 381; graduates, 65. The forty-first session begins Sept. 16, 1914, and ends June 16, 1915.

MEHARRY MEDICAL COLLEGE, Colored. Maple and Chestnut Streets.—This school was organized in 1876 and is the Medical Department of Walden University. The faculty is made up of 13 professors and 15 instructors, demonstrators, etc., 28 in all. The work embraces four years of thirty weeks each. The total fees for each of the first three years are $70 and for the fourth year, $80. The Dean is Dr. G. W. Hubbard. Total registration for 1913-14 was 359; graduates, 73. The thirty-ninth session begins Sept. 9, 1914, and ends April 20, 1915.

TEXAS

Texas, population 3,096,542 has four medical colleges. The University of Texas Department of Medicine is located at Galveston, a city of 36,981 inhabitants. The Texas Christian University School of Medicine is at Fort Worth, population 73,312. The Baylor University College of Medicine and the Southern Methodist University Medical Department are situated in Dallas, population 92,104.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University at Waco. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty numbers 46. Entrance requirement is one year of college work in addition to a four-year high school education. The course is four years of eight months each. The fees are $115 each year; matriculation fee of $5, paid but once; graduation fee, $15. The Dean is Dr. E. H. Cary. Total registration for 1913-14 was 50; graduates, 18. The fifteenth session begins Sept. 28, 1914, and ends May 31, 1915.

SOUTHERN METHODIST UNIVERSITY MEDICAL DEPARTMENT.—Organized in 1903 as the Southwestern University Medical College. Name changed as above in 1912. The first class graduated in 1904. It has a faculty of 13 professors and 25 instructors, assistants, etc., a total of 38. The course of instruction covers four years of eight months each. One year of collegiate work in addition to a four-year high-school education is required for admission. The fees for the four years are, respectively, $113, $108, $103 and $125. The Dean is Dr. John O. McKeynolds. Total registration for 1913-14 was 51; graduates, 17. The eleventh session begins Sept. 30, 1914, and ends June 3, 1915.

Fort Worth

TEXAS CHRISTIAN UNIVERSITY SCHOOL OF MEDICINE, Calhoun and Fifth Streets.—Organized in 1894 as the Fort Worth School of Medicine, the Medical Department of the Fort Worth University. In 1912 the latter institution changed its name to Texas Christian University. The first class graduated in 1895. Became an integral part of Texas Christian University in 1913. It has a faculty of 19 professors and 38 lecturers, assistants, etc., in all 57. One year of collegiate work in addition to a four-year high school education is required for admission. The course covers four years of nine months each. The total fees for each of the four years, respectively, are $114, $113, $108 and $125. The Dean is Dr. I. C. Chase. The total registration for 1913-14 was 48; graduates, 11. The twenty-first session begins Sept. 8, 1914, and ends June 4, 1915.

Galveston

UNIVERSITY OF TEXAS DEPARTMENT OF MEDICINE, on the Strand, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 16 professors and 13 lecturers, a total of 29. The curriculum embraces four years of eight months each. The entrance requirement is one year of collegiate work in addition to a four-year high school education. The total fees for the four years, respectively, are $75, $50, $27.50 and $10. The Dean is Dr. William S. Carter. Total registration for 1913-14 was 172; graduates, 23. The twenty-fourth session begins Oct. 1, 1914, and ends May 31, 1915.

UTAH

Utah, population 373,351, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 92,777 people.

To be eligible to secure licenses to practice medicine in Utah, students matriculating in and after the session of 1912-13, in addition to a four-year high school education, must have completed at least one year of collegiate work prior to beginning the study of medicine, this preliminary college work to have included college courses in physics, chemistry and biology.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of the medical course. Each course covers thirty-six weeks. *Two years* of collegiate work are required for admission. The medical faculty consists of 10 professors and 9 lecturers and assistants, a total of 19. The fees are $65 each year for residents and $80 each year for non-residents. Total registration for 1913-14 was 20. The eighth session begins Sept. 14, 1914, and ends June 3, 1915.

VERMONT

Vermont, population 355,956, has one medical school, located at Burlington, a town of 20,468 people.

Students matriculating in and after the session of 1912-13 who desire to practice medicine in Vermont, must have obtained a preliminary training of at least one year of collegiate work in addition to a standard four-year high school education, this additional year's work to include college courses in physics, chemistry and biology.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1826, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 48. One year of college

work in addition to a standard four-year high-school education is required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are $145, and $175 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1913-14 was 117; graduates, 39. The next session begins Sept. 23, 1914, and ends June 23, 1915.

VIRGINIA

Virginia, population 2,061,612, has two medical colleges, one, the Department of Medicine of the University of Virginia, situated in Charlottesville, population 6,765, and the Medical College of Virginia at Richmond, population 127,628.

Only graduates of Medical Colleges registered by the Virginia State Board of Medical Examiners are eligible to obtain licenses to practice medicine in this state. Medical colleges to be so registered must require of all students admitted in the sessions of 1914-15 and thereafter, completion of at least one year of collegiate work including college courses in physics, chemistry and biology, in addition to a standard four-year high-school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 14 professors and 21 lecturers, instructors, assistants, etc., a total of 35. The requirements for admission are the completion of a four years' high school course, or its equivalent, and a year of college work devoted to chemistry, physics and biology. Total fees each year are $140. The Dean is Dr. R. H. Whitehead. The total registration for 1913-14 was 104; graduates 17. The eighty-sixth session begins Sept. 14, 1914, and ends June 16, 1915.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 46 professors and 77 lecturers, instructors, etc., a total of 123. The requirement for admission is a four-year high school education and in addition a full year of collegiate work. The course embraces four years of eight months each. Fees, $164 for the first year and $114 for each subsequent year; graduation fee, $30. The Dean is Dr. Stuart McGuire. The total registration for 1913-14, 386; graduates, 88. The eighty-sixth session begins Sept. 15, 1914, and ends June 1, 1915.

WEST VIRGINIA

West Virginia, population 1,221,119, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 9,150 population.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. One year of work in an approved college of liberal arts is required for admission. Session extend through nine months. The faculty numbers 11. Fees: For residents of the state, $25 each year; for non-residents, $50. The Dean is Dr. John N. Simpson. The total registration for 1913-14 was 21. The next session begins Sept. 14, 1914, and ends June 16, 1915.

WISCONSIN

Wisconsin, population 2,333,860, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 25,531 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 373,857 people.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least *two years* in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French and German, and at least a year's work in physics, chemistry and biology. It has a faculty of 11 professors and 14 lecturers, instructors, etc., a total of 25. Tuition fees: For residents of the state, $70 each year; for non-residents, $170. The Dean is Dr. Charles R. Bardeen. The registration for 1913-14 was 83. The seventh session begins Sept. 23, 1914, and ends June 18, 1915.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 37 professors and 79 assistants, instructors, etc., a total of 116. The entrance requirements include, in addition to a four-year high school education, one year of college work, including courses in physics, chemistry, biology and a modern language. After Jan. 1, 1915, *two years* of college work will be required. The curriculum is for four years for thirty-four weeks each. The total fees for the four years, respectively, are $180, $175, $175 and $175. The Dean is Dr. Louis F. Jermain. The registration for 1913-14 was 169, graduates 43. The third session begins Oct. 1, 1914, and ends June 17, 1915.

PHILIPPINE ISLANDS

The Philippine Archipelago, having a population of 7,635,436, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the Medical Faculty of the University of St. Thomas. They are located in the city of Manila, which in 1903 had a population of 219,928.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. Present title in 1910. The faculty includes 22 professors and 44 lecturers, assistants, etc., a total of 66. *Two years* of collegiate work leading to the degree of Bachelor of Arts are required for admission. The course extends over five years of nine months each with an additional sixth year of intern service. The Dean is Dr. William E. Musgrave. The total registration for 1913-14 was 82, graduates 9. The eighth session begins July 1, 1914, and ends March 30, 1915.

CANADA

The Dominion of Canada has nine medical colleges, all but one of which require a five-year course, including in the first-year courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require one year of college work for admission, including the science courses named. None of the Canadian colleges has a fixed minimum requirement of two years of collegiate work, or its equivalent, preliminary to or as a part of the medical course. A new medical school at Edmonton, Alberta gives only the first two years of the medical course, including the preliminary science year.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers only the first two years of the medical course, including the preliminary science year. The faculty numbers 7. Fees for the first year are $50; for the second, $75. The registrar is Cecil E. Race, B.A. The registration for 1913-14 was 26. The second session begins Sept. 30, 1914, and ends May 12, 1915.

Manitoba

MANITOBA MEDICAL COLLEGE, Winnipeg.—It is the Medical Faculty of the University of Manitoba. Organized in 1883, first class graduated in 1886 and a class graduated each subsequent year. The faculty numbers 58. The fees are $155 for the first year and $150 for each subsequent year. The entire course covers five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. H. H. Chown, 263 Broadway, Winnipeg. Total registration for 1913-14 was 188, graduates, 43. The next session begins Sept. 21, 1914, and ends May 1, 1915.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the University and the Board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 37 professors, lecturers and demonstrators. Requires matriculation examination and a graded course of five years, including preliminary courses in physics, chemistry and biology. Fees are $100 each year. Total registration for 1913-14 was 75, graduates, 15. The Secretary is Dr. A. W. H. Lindsay, 319 Pleasant Street, Halifax, N. S. The next session begins Sept. 9, 1914, and ends May 6, 1915.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1903 it absorbed Trinity Medical College. The course of study covers five years of eight months each, the first year including courses in physics, chemistry and biology. It has a faculty of 54 professors and 129 lecturers, associates, etc., a total of 183. The fees are $150 each year. The Secretary is Dr. A. Primrose. The total registration for 1913-14 was 554, graduates, 85. The next session begins Sept. 29, 1914, and ends May 29, 1915.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the University, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 25 professors and 14 assistants, instructors, etc., a total of 39. The fees amount to $105 each year; fee for M.D., C.M. degrees, $30. The course covers five years of seven months each, the first year including courses in physics, chemistry and biology. The total registration in 1913-14 was 268; graduates, 50. The Dean is Dr. J. C. Connell. The next session begins Sept. 14, 1914, and ends April 28, 1915.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883 and a class graduated each year subsequently. The faculty numbers 37. The course is five years of eight months each, the first year including courses in physics, chemistry and biology. The tuition is $110 each year. The Registrar is Dr. W. E. Waugh. Total registration for 1913-14 was 90, graduates, 27. The next session begins Oct. 1, 1914, and ends June 5, 1915.

Montreal

McGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-39 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over five years of eight months each, including the preliminary year devoted to physics, chemistry and biology. The faculty numbers 120. The total fees are $164 for each of the first four years and $191 for the fifth. The total registration for 1913-14 was 382, graduates, 63. The Registrar is Dr. John W. Scane. The next session begins Oct. 1, 1914, and ends June 8, 1915.

MONTREAL SCHOOL OF MEDICINE AND SURGERY, Montreal.—Organized in 1878 as the Medical Department of Laval University. Present name assumed in 1911. First class graduated in 1879. The faculty numbers 60. The course extends over five years, including preliminary courses in physics, chemistry and biology. The Dean is Dr. E. P. Lachapelle. The total registration for 1913-14 was 132, graduates, 22. The next session begins Oct. 1, 1914, and ends June 20, 1915.

Quebec

LAVAL UNIVERSITY MEDICAL DEPARTMENT, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 24. The fees are $60 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. Michael Joseph Ahren, Quebec. Total registration for 1913-14 was 88, graduates, 14. The next session begins Sept. 9, 1914, and ends June 1, 1915.

STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION

Essentials of an Acceptable Medical College

(Revised to August 10, 1914)

The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress among the medical colleges in the United States. It also represents the basis on which medical colleges are rated in the Council's classifications.

ADMISSION OF STUDENTS

1. A strict enforcement of the following standards and requirements, the college itself to be held responsible for any instances in which they are not enforced.

[Since the product of the medical school depends largely on the quality of the students admitted, in rating medical colleges, special emphasis is laid by the Council on the strictness and honesty by which the standards of admission and advanced standing are administered. By the admission of unfit students the school is handicapped from the very beginning and, in the opinion of the Council, deserves a low rating regardless of its equipment, its clinical facilities and its teaching force.]

2. A requirement for admission of at least a four-year-high-school education, and in addition at least one year of college work, including at least eight semester hours each of physics, chemistry and biology of college grade and a reading knowledge of German or French.

3. These minimum requirements for admission to the study of medicine are set forth in the following statements relating (1) to the high school work and (2) to the work of the preliminary college year. The prescribed minimum of work in physics, chemistry, biology and German or French should be required by every medical school whether given in a preliminary year by the medical school itself or required in one or more years of collegiate work. The statements are as follows:

ADMISSION TO THE PRELIMINARY COLLEGE YEAR

(*a*) For admission to the preliminary college year, students must have completed a four-year course of at least fourteen units in a standard accredited high school or other institution of standard secondary school grade, or have its equivalent as demonstrated by an examination. A transcript of the student's work should be secured direct from the principal of the secondary school by the college authorities and kept on file. This evidence of actual attendance at the secondary school or schools should be obtained for every student no matter whether he is admitted by examination or on presentation of acceptable credentials.

(*b*) The subjects for which credits for admission to the preliminary college year may be accepted are shown in the following schedule:

SCHEDULE OF SUBJECTS OFFERED IN ACADEMIC AND SECONDARY SCHOOLS, CREDITS IN WHICH ARE ACCEPTABLE FOR ENTRANCE TO THE PRELIMINARY COLLEGE YEAR LEADING TO THE MEDICAL COURSES

SUBJECTS	UNITS	REQUIRED	ELECTIVE
ENGLISH			
READING AND PRACTICE	2	2	...
Study and Practice	1	...	1
MATHEMATICS			
ALGEBRA TO QUADRATICS	1	1	...
Algebra (Quadratic Equations, Binomial Theorem and Progressions)	½	...	½
PLANE GEOMETRY	1	1	...
Solid Geometry	½	...	½
Trigometry	½	...	½
LATIN			
GRAMMAR AND COMPOSITION	1	*	1
CAESAR	1	*	1
Cicero	1	...	1
Virgil	1	...	1
Cornelius Nepos	1	...	1
Greek			
Grammar and Composition	1	*	1
Xenophon	1	...	1
Homer	1	...	1
GERMAN (OR FRENCH)			
ELEMENTARY	2	2*	...
Intermediate	1	...	1
Spanish			
Elementary	2	...	2
Scandinavian			
Elementary	2	...	2
HISTORY			
AMERICAN HISTORY AND CIVIL GOVERNMENT	1	1	...
Greek and Roman History	1	...	1
Medieval and Modern History	1	...	1
English History	1	...	1
Science †			
Botany and Zoology, each	1	...	1
or Biology	1	...	1
Chemistry	1	...	1
Physics	1	...	1
Physiography	½	...	½
Physiology	½	...	½
Agriculture	1	...	1
Drawing	1	...	1
Manual Training	1	...	1
Domestic Science	1	...	1
Music			
Appreciation or Harmony	1	...	1
Total	35½	7	28½

A *unit* is the credit value of at least 36 weeks' work of 4 or 5 recitation periods per week, each recitation period to be of not less than 40 minutes. In other words, a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

Required Branches: Of the 14 units of high-school work it is suggested that the subjects in capitals aggregating 7 units be required. Other work to the amount of at least 7 units may be made up from any of the other subjects of the above schedule.

* Two units of Greek or Latin may be substituted for the two required units of French or German.

† Credentials of each science course should include evidence of laboratory work.

WORK OF THE PRELIMINARY COLLEGE YEAR

(*c*) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(*d*) In excellence of teaching and in content, the work of this preliminary college year shall be at least equal to the work done in the freshman year in standard colleges and universities.

(*e*) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the accompanying schedule, provided that a student may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues and does not duplicate the work done in the high school.

(*f*) If a satisfactory "reading knowledge" of German or French is to be obtained in the one year of college work it is essential that an advanced course be offered and that the student have completed as a prerequisite in the high school two units of elementary work in German or French.

(*g*) By requiring two years of collegiate work for admission, medical schools would have a greater latitude in the acceptance of high-school credentials. For example, the language requirement in the high school would not be so essential since the deficiency could easily be made up in the two years of collegiate work.

(*h*) "College work" cannot be considered as acceptable unless it has been preceded by a completed course of study in a standard four-year secondary school or its full educational equivalent.

(*i*) Credits for two or more years of collegiate work cannot be considered acceptable unless courses in physics, chemistry and biology have been completed. It is urged that a reading knowledge of German or French also be required.

(*j*) Medical colleges giving these science courses in a premedical year, should provide expert full-time teachers in the various subjects, should provide laboratory equipment sufficient to enable the student to do the work intelligently and should provide a training in the subjects no less thorough than that given in standard colleges of liberal arts.

(*k*) Postgraduate courses given in high schools by high-school teachers cannot as a rule be considered equal to college courses given by college teachers.

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods * Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1....	2	2	4	8
Chemistry, 1..	2	2	4	8
Biology, 1....	2 or 3	2 or 1	4	8
German or French, 2...	4 or 3	.....	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1....	64	128	192
Chemistry, 1.	64	128	192
Biology, 1....	64 or 96	128 or 64	192 or 160
German or French, 2..	128 or 96	.....	128 or 96
Totals	320	384 or 320	704 or 640

(*l*) A year of work in a college of dentistry or a college of pharmacy should not as a rule be considered as an equivalent of the required premedical college science year.

(*m*) The object of the work of the preliminary college year is to provide the student with a training that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

4. Entrance Conditions. (*a*) During the next few years (until 1917) candidates who have completed at least one year of work in an approved college of liberal arts may be admitted conditioned in one-half of the required course in physics or one-half of the course in a modern language, these conditions to be removed before the beginning of the work of the second medical year.

(*b*) Candidates who have completed two or more years of work in an approved college of liberal arts may be admitted conditioned in all of the required course in physics or all of the course in a modern language, these conditions to be removed before the beginning of the second medical year.

(*c*) Candidates holding baccalaureate degrees from approved colleges of liberal arts but who have not taken the required courses in physics, chemistry or biology, may be admitted conditioned in those subjects, such conditions to be removed before entering on the work of the second medical year.

So far as possible, however, all deficiencies should be removed during the summer preceding entrance to the freshman medical year and the summer between the first and second medical years.

5. The college should require that students be in actual attendance in the college within the first week of each annual session and thereafter.

6. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and under no circumstances should credit be given for any course where the attendance has been less than 80 per cent. of the full time.

7. (*a*) Full advanced standing may be granted to students only for work done in other acceptable colleges and in granting advanced standing there should be no discrimination against the college's full-course students. (*b*) In *exceptional cases* students from Class B medical schools may be given advanced standing but not higher than *entrance* to the third year (junior) class and no credit should be given in any subject except on the recommendation of the head of the department teaching that subject. (*c*) In *exceptional cases* students from Class C colleges may be given advanced standing but not higher than *entrance* to the second year (sophomore) class and then only after thorough examinations in all first year subjects have been passed.

SUPERVISION, EQUIPMENT, TEACHERS

8. There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out fair ideals of medical education as interpreted by modern knowledge.

9. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students and the post-mortem cases used in teaching.

10. The college should have a fully graded course covering four years of at least 32 weeks each, exclusive of time required for matriculation and holidays, and at least 30 hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

(*a*) The college should give two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present day medical knowledge makes it quite essential that these subjects be in charge of full-time, thoroughly trained teachers.

(*b*) Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

(*c*) As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an intern in an approved hospital.

11. The college should provide at least six expert, thoroughly trained professors in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is advised that four of these professors be placed in charge of the departments of (*a*) anatomy, (*b*) physiology, (*c*) pathology and bacteriology and (*d*) physiologic chemistry and pharmacology. The other two may be assigned one to the laboratory course in histology and embryology under the department of anatomy and the other to the department

of pathology and bacteriology, possibly to the course in laboratory clinical diagnosis. There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having sixty students or less in each class, there should be at least one full-time salaried assistant for each of the four departments mentioned, and at least one additional assistant in each of these departments should be provided for each additional thirty students enrolled. This represents a low average of the full-time assistants already employed by the accepted medical colleges.

12. The faculty should be thoroughly organized and should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Non-medical men should be selected as teachers in medical schools only under exceptional circumstances and only because medical men of equal special capacity are not available. All faculty members should be appointed because of their ability as teachers and not because they happen to be on the attending staff of a hospital or for other like reasons.

CLINICAL FACILITIES

13. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students *or less*) of not less than 200 patients which can be utilized for clinical teaching, these patients to be of such character as to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties.

14. The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

15. At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

16. Facilities should be provided for at least 30 necropsies during each college session which are attended and can be participated in by senior students (for senior classes of 100 students *or less*).

17. The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 60 cases (for senior classes of 100 students *or less*), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be regular in attendance.

OTHER TEACHING FACILITIES

18. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and 30 or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

19. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from post-mortems there also be kept the record of the post-mortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen.

20. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver; to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

21. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for a reasonable amount of medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals great care should be used to prevent needless suffering and work by students should be carefully supervised.

22. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen ray and other apparatus now so generally used in medical teaching.

23. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

24. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

By vote of the House of Delegates of the American Medical Association the Council on Medical Education has been given special instructions at various times as follows:

(*a*) Not to rate higher than Class C any medical college which gives the major portion of its instruction after four o'clock in the afternoon (Atlantic City, June, 1907).

(*b*) To include in Class A only such medical colleges as required for admission, in addition to an accredited four-year high school course, at least one year of college credits in physics, chemistry and biology (Atlantic City, June, 1912). In 1914 (June, Atlantic City), it was emphasized that the courses in physics, chemistry and biology to be acceptable should be of college grade.

(*c*) No college is to be rated higher than Class C which is conducted as a stock corporation in the interests of the stockholders. (Atlantic City, June, 1914.)

NOTE.—Correspondence from medical colleges regarding any of the above requirements is invited, and any further suggestions or information available will be gladly furnished.

Definitions of a Medical College* and a Medical School†

"An institution to be ranked as a medical college must have at least (6) professors giving their entire time to medical work, a graded course of four full years of college grade in medicine, and must require for admission not less than the usual four years of academic or high-school preparation, or its equivalent, in addition to the preacademic or grammar school studies."

By a medical school as differentiated from a medical college is meant a part of a university requiring for admission two years of collegiate work, or its equivalent, and offering instruction of not less than two years' duration, leading to the degree of Doctor of Medicine.

Grading of Medical Colleges

As in the previous classifications, all medical colleges were rated by the Council on Medical Education on a civil service basis on a scale of 1,000 points. The data relating to each college were grouped under ten general heads in such manner that the groups would have as nearly equal weight as possible, each group, allowing a possible 100 points (10 per cent.) out of a possible 1,000 points (100 per cent.). The ten heads under which the data were arranged are as follows:

1. Showing of graduates before state boards and other evidences of the training received.
2. Enforcement of a satisfactory preliminary educational requirement, granting of advanced standing and the character of records.
3. Character of curriculum, grading of course, length of session, time allowed for matriculation and supervision.
4. Medical school buildings; light, heat, ventilation, cleanliness.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.

* This definition of a college is based on that given in the revised ordinances of the state of New York. It has been adopted also by the Carnegie Foundation for the Advancement of Teaching.

† Based on the definition of the term "school" adopted in 1909 by the Association of American Universities.

7. Hospital facilities and instruction, maternity work, autopsies, specialties.
8. Faculty, number and qualifications of trained teachers, full-time instructors, and assistants, especially of the laboratory branches, organization, and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty directly or indirectly.
10. Possession and use made of libraries, museums, charts, stereopticons, etc.

Class A+ colleges are those which are acceptable; Class A those which need improvement in certain respects, but which are otherwise acceptable; Class B, those which, under their present organization, might be made acceptable by general improvements, and Class C, those which require a complete reorganization to make them acceptable.

Third Classification of Medical Colleges

Revised to June 21, 1914

CLASS A PLUS—ACCEPTABLE MEDICAL COLLEGES

1. Giving an Acceptable Four-Year Course:

CALIFORNIA

Leland Stanford Junior Univ., School of Med..San Francisco
University of California, College of Medicine.....
.....San Francisco-Los Angeles

CONNECTICUT

Yale Medical School.....New Haven

ILLINOIS

Northwestern University Med. School.....Chicago
Rush Medical College (University of Chicago).....Chicago

INDIANA

Indiana University School of Medicine.....
..... Bloomington-Indianapolis

IOWA

State Univ. of Iowa, Coll. of Med.....Iowa City

LOUISIANA

Tulane University of Louisiana, School of Med..New Orleans

MARYLAND

Johns Hopkins University, Medical Department...Baltimore

MASSACHUSETTS

Medical School of Harvard University.....Boston

MICHIGAN

University of Michigan, Dept. of Med. and Surg..Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSOURI

Washington University Medical School.....St. Louis

NEBRASKA

University of Nebraska, College of Medicine[1]..... Omaha

NEW YORK

Columbia University, College of Phys. and Surgs.....
.....New York City
Cornell University Medical College.....New York City
University and Bellevue Hospital Medical College.....
.....New York City
Syracuse University, College of Medicine.....Syracuse

OHIO

Medical College of the University of Cincinnati...Cincinnati
Ohio State University, College of Medicine[2].....Columbus
Western Reserve University, School of Medicine...Cleveland

PENNSYLVANIA

Jefferson Medical College[2].....Philadelphia
University of Pennsylvania, School of Medicine.Philadelphia
University of Pittsburgh, School of Medicine[2]....Pittsburgh

TENNESSEE

Vanderbilt University, Medical Department[1].....Nashville

TEXAS

University of Texas, Department of Medicine.....Galveston

VIRGINIA

University of Virginia, Dept. of Med.....Charlottesville

2. Giving a Two-Year Course Acceptably:

MISSOURI

University of Missouri, School of Medicine.....Columbia

WISCONSIN

University of Wisconsin Medical School.....Madison

Total 29

CLASS A—COLLEGES ALSO ACCEPTABLE WHICH COULD MAKE CERTAIN IMPROVEMENTS TO ADVANTAGE

1. Giving a Complete Four-Year Course:

ALABAMA

University of Alabama, School of Medicine.....Mobile

COLORADO

University of Colorado, School of Med.....Boulder-Denver

DISTRICT OF COLUMBIA

Georgetown University, School of Medicine.....Washington
George Washington University, Med. School....Washington
Howard University, School of Medicine.....Washington

GEORGIA

Atlanta Medical College[3].....Atlanta
University of Georgia, Medical Dept.[4].....Augusta

ILLINOIS

University of Illinois, College of Medicine.....Chicago

IOWA

State Univ. of Iowa, Coll. of Homeopathic Med...Iowa City

KANSAS

University of Kansas, School of Med.....Lawrence-Rosedale

KENTUCKY

University of Louisville, Medical Department.....Louisville

MAINE

Medical School of Maine.....Brunswick-Portland

MARYLAND

College of Physicians and Surgeons.....Baltimore
University of Maryland, School of Medicine.....Baltimore

MASSACHUSETTS

Boston University School of Medicine.....Boston
Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery[5].....Detroit
University of Michigan, Homeopathic Med. Coll..Ann Arbor

MISSOURI

St. Louis University School of Medicine.....St. Louis

NEW YORK

Albany Medical College.....Albany
Fordham University, School of Medicine[3]....New York City
Long Island College Hospital[3].....Brooklyn
New York Homeopathic Medical College and Flower Hospital.....New York City
University of Buffalo, Medical Department.....Buffalo

OREGON

University of Oregon, Department of Medicine.....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia
Medico-Chirurgical College of Philadelphia.....Philadelphia
Woman's Medical College of Pennsylvania.....Philadelphia

1. Rating changed to Class A+ June 21, 1914.
2. Rating changed to Class A+ Feb. 24, 1914.
3. Rating changed to Class A Feb. 24, 1914.
4. Rating changed to Class A Feb. 24, 1913.
5. Rating changed to Class A June 21, 1914.

TENNESSEE
University of Tennessee, College of Medicine[8].....Memphis

VERMONT
University of Vermont, College of Medicine.....Burlington

VIRGINIA
Medical College of Virginia.....Richmond

2. Giving a Two-Year Course:

MISSISSIPPI
University of Mississippi, Department of Medicine...Oxford

NEW HAMPSHIRE
Dartmouth Medical School.....Hanover

NORTH CAROLINA
University of North Carolina, School of Medicine..Chapel Hill
Wake Forest College, School of Medicine.....Wake Forest

NORTH DAKOTA
University of North Dakota, School of Medicine..University

SOUTH DAKOTA
University of South Dakota, College of Medicine...Vermilion

UTAH
University of Utah, School of Medicine.....Salt Lake City

Total 38

CLASS B—COLLEGES NEEDING GENERAL IMPROVEMENTS TO BE MADE ACCEPTABLE

1. Giving a Complete Four-Year Course:

ALABAMA
Birmingham Medical College[6].....Birmingham

ARKANSAS
University of Arkansas, Medical Department.....Little Rock

CALIFORNIA
College of Physicians and Surgeons.....Los Angeles
Hahnemann Medical College of the Pacific....San Francisco
Oakland College of Medicine and Surgery.....Oakland

ILLINOIS
Bennett Medical College.....Chicago
Chicago College of Medicine and Surgery.....Chicago
Hahnemann Medical College and Hospital.....Chicago

NEBRASKA
John A. Creighton Medical College.....Omaha

NORTH CAROLINA
North Carolina Medical College[7].....Charlotte

OHIO
Eclectic Medical College.....Cincinnati

OKLAHOMA
Univ. of Oklahoma, School of Med..Norman-Oklahoma City

PENNSYLVANIA
Temple University, Department of Medicine....Philadelphia

SOUTH CAROLINA
Medical College of the State of South Carolina[8]....Charleston

TENNESSEE
Lincoln Memorial University, Medical Dept.[9].....Knoxville
Meharry Medical College[10].....Nashville

TEXAS
Baylor University, College of Medicine.....Dallas
Texas Christian University, School of Medicine[11].Fort Worth
Southern Methodist University, Medical Dept.[11].....Dallas

WISCONSIN
Marquette University, School of Medicine.....Milwaukee

2. Giving a Two-Year Course:

NORTH CAROLINA
Leonard Medical School[12].....Raleigh

WEST VIRGINIA
West Virginia University School of Medicine...Morgantown

Total 22

CLASS C—COLLEGES REQUIRING A COMPLETE REORGANIZATION TO MAKE THEM ACCEPTABLE

CALIFORNIA
California Eclectic Medical College.....Los Angeles
College of Physicians and Surgeons.....San Francisco
College of Medical Evangelists.....Loma Linda

GEORGIA
Georgia College of Eclectic Medicine and Surgery....Atlanta
Southern College of Med. and Surgery[13].....Atlanta

ILLINOIS
Chicago Hospital College of Medicine.....Chicago
Jenner Medical College.....Chicago

MARYLAND
Eastern University School of Medicine[14].....Baltimore
Maryland Medical College[14].....Baltimore

MASSACHUSETTS
College of Physicians and Surgeons[15].....Boston

MISSOURI
American Medical College.....St. Louis
Eclectic Medical University[16].....Kansas City
Ensworth Medical College.....St. Joseph
Kansas City Hahnemann Medical College.....Kansas City
St. Louis College of Physicians and Surgeons.....St. Louis

NEBRASKA
Cotner University Medical College.....Lincoln

NEW YORK
New York Med. Coll. and Hosp. for Women..New York City

OHIO
Cleveland-Pulte Medical College.....Cleveland
Toledo Medical College.....Toledo

TENNESSEE
University of West Tenn. Coll. of Med. and Surg...Memphis

Total 20

Note.—Official statements from the following state licensing boards indicate that as a rule the colleges rated in Class C are not recognized:

Alabama	Maryland (Reg.)	Pennsylvania
Arkansas (Reg.)	Michigan	Porto Rico
Colorado	Minnesota	Rhode Island
Connecticut (Reg.)	Mississippi	South Carolina
Delaware	New Hampshire	South Dakota
Florida	New Jersey	Texas
Georgia	New Mexico	Vermont
Indiana	New York	Virginia
Iowa	North Dakota	West Virginia
Kentucky	Ohio	Wisconsin
Louisiana (Reg.)	Oklahoma	

Of the above states the boards of New Hampshire, Rhode Island and Virginia recognize only the medical colleges listed in Classes A+ and A.

6. Will offer only a postgraduate course after the class of 1915 has graduated.
7. Has merged with the Medical College of Virginia at Richmond, but will retain a nominal existence until it has granted the degrees for the three remaining classes which will receive the balance of their medical instruction at Richmond. Rating changed to Class B June 21, 1914.
8. Rating changed to Class B Feb. 24, 1913.
9. Has merged with the University of Tennessee, College of Medicine at Memphis. The three remaining classes will be taught at Memphis, but the degrees will be granted by the Lincoln Memorial University. Rating changed to Class B June 21, 1914.
10. Rating changed to Class B Feb. 24, 1914.
11. Rating changed to Class B May 10, 1914.
12. Has discontinued clinical teaching, hereafter to give only two years of the medical course. Rating changed to Class B June 21, 1914.
13. Reported not recognized by the Georgia State Board of Medical Examiners.
14. Reported not recognized by the Maryland State Board of Medical Examiners.
15. Reported not recognized by the Massachusetts Medical Society.
16. Reported not recognized by the Missouri State Board of Health.

State Requirements of Higher Preliminary Education

There are now twenty states which have adopted requirements of preliminary education in addition to a standard four-year high-school education. These states, the number of college years required and the time the higher requirement becomes effective are as follows:

State Examining Board of—	Number of Years Required	Affects Students Matriculating	Affects All Applicants
Minnesota	2	1908-09	1912
North Dakota	2	1908-09	1912
Colorado	2	1910-11	1914
Connecticut	1	1910-11	1914
Kansas	1	1910-11	1914
Indiana	2	1910-11	1914
Utah	1	1910-11	1914
Iowa	2	1911-12	1915
South Dakota	2	1911-12	1915
Vermont	1	1912-13	1916
Illinois	1	1914-15	1918
Kentucky	1	1914-15	1918
Michigan	1	1914-15	1918
New Hampshire	1	1914-15	1918
Pennsylvania	1	1914-15	1918
Rhode Island	1	1914-15	1918
Virginia	1	1914-15	1918
Alabama	2	1915-16	1919
Arkansas	1	1915-15	1919
California	1	1915-16	1919

Colleges Having Higher Entrance Requirements

The thirty-four medical schools which are now requiring as a minimum for entrance *two or more years* of work in a college of liberal arts in addition to a four-year high-school education are as follows:

	Requirement Began
CALIFORNIA	
Leland Stanford Junior University, School of Medicine	1909
University of California, College of Medicine	1905
COLORADO	
University of Colorado, School of Medicine	1910
CONNECTICUT	
Yale Medical School	1909
DISTRICT OF COLUMBIA	
Georgetown University, School of Medicine	1912
Howard University, School of Medicine	1914
ILLINOIS	
Northwestern University Medical School	1911
Rush Medical College (University of Chicago)	1904
University of Illinois, College of Medicine	1914
INDIANA	
Indiana University, School of Medicine	1910
IOWA	
State University of Iowa, College of Medicine	1910
State University of Iowa, Coll. of Homeopathic Medicine	1910
KANSAS	
University of Kansas, School of Medicine	1909
MARYLAND	
Johns Hopkins University, Medical Department	1893
MASSACHUSETTS	
Medical School of Harvard University	1900
MICHIGAN	
University of Michigan, Department of Medicine and Surgery	1909
MINNESOTA	
University of Minnesota Medical School	1907
MISSOURI	
University of Missouri, School of Medicine	1910
Washington University Medical School	1912
NEBRASKA	
University of Nebraska, College of Medicine	1909
NEW HAMPSHIRE	
Dartmouth Medical School	1910
NEW YORK	
Columbia University, College of Physicians and Surgeons	1910
Cornell University Medical College	1908
Syracuse University, College of Medicine	1910
NORTH CAROLINA	
Leonard Medical School	1914
Wake Forest College School of Medicine	1908
NORTH DAKOTA	
University of North Dakota, School of Medicine	1907
OHIO	
Western Reserve University School of Medicine	1907
Medical College of the University of Cincinnati	1913
PENNSYLVANIA	
University of Pennsylvania, School of Medicine	1910
University of Pittsburgh, School of Medicine	1913
SOUTH DAKOTA	
University of South Dakota, College of Medicine	1909
UTAH	
University of Utah, School of Medicine	1910
WISCONSIN	
University of Wisconsin Medical School	1907

The fifty following colleges require, in addition to a four-year high-school course, one year of college work in physics, chemistry, biology and a modern language, the requirement beginning in the year given:

	In Force
ALABAMA	
University of Alabama, School of Medicine	1914
CALIFORNIA	
College of Physicians and Surgeons, Los Angeles	1914
College of Medical Evangelists	1914
DISTRICT OF COLUMBIA	
George Washington University, Medical School	1914
GEORGIA	
Atlanta Medical College	1914
University of Georgia, Medical Department	1914
ILLINOIS	
Bennett Medical College	1914
Chicago College of Medicine and Surgery	1914
Hahnemann Medical College and Hospital	1914
Jenner Medical College	1913
KENTUCKY	
University of Louisville, Medical Department	1914
LOUISIANA	
Tulane University of Louisiana, School of Medicine	1910
MAINE	
Medical School of Maine	1912
MARYLAND	
College of Physicians and Surgeons	1914
University of Maryland, School of Medicine	1914
MASSACHUSETTS	
Boston University, School of Medicine	1914
Tufts College Medical School	1914
MICHIGAN	
Detroit College of Medicine and Surgery	1914
University of Michigan, Homeopathic Medical College	1912
MISSISSIPPI	
University of Mississippi, Department of Medicine	1914
MISSOURI	
St. Louis University, School of Medicine	1910
American Medical College	1914
NEBRASKA	
John A. Creighton Medical College	1914
NEW YORK	
Albany Medical College	1914
Fordham University, School of Medicine	1911
Long Island College Hospital	1914
University and Bellevue Hospital Medical College	1912
University of Buffalo, Medical Department	1914
NORTH CAROLINA	
University of North Carolina, School of Medicine	1910
OHIO	
Ohio State University, College of Medicine	1914
OKLAHOMA	
University of Oklahoma, School of Medicine	1914
OREGON	
University of Oregon, Department of Medicine	1910
PENNSYLVANIA	
Hahnemann Medical College and Hospital	1913
Jefferson Medical College	1913
Medico-Chirurgical College of Philadelphia	1913
Temple University, Department of Medicine	1913
Woman's Medical College of Pennsylvania	1913
SOUTH CAROLINA	
Medical College of the State of South Carolina	1914
TENNESSEE	
Vanderbilt University, Medical Department	1914
University of Tennessee, College of Medicine	1914
University of West Tennessee, College of Medicine and Surgery	1914

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TABLE I.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number.	NAME AND LOCATION OF COLLEGE	Population of city where college is located. (Census of 1910)	Classification by Council on Medical Education.*	No. of students registered 1913-14		Graduates 1914		Grads. with A.B., B.S. or Ph.B.	No. of teachers.	Weeks in college year.	Total Fees (Dollars).				Executive Officer	Session of 1914-15		Marginal Number.
				Men.	Women.	Men.	Women.				1st year.	2d year.	3d year.	4th year.		Begins 1914	Ends 1915	
	ALABAMA			**151**	...	**51**	...	**5**										
1	Birmingham Medical College, Birmingham (a)	132,685	B	57	...	30	...	1	22	32	...	...	...	130	E. P. Hogan, M.D. Secretary	Oct. 1	May 28	1
2	University of Alabama, School of Medicine, Mobile	51,521	A	94	...	21	...	4	55	32	160	155	155	175	Eugene B. Bondurant, M.D., Dean	Sept. 24	June 9	2
	ARKANSAS			**94**	**1**	**34**	...	**1**										
3	University of Arkansas, Medical Department, Little Rock	45,941	B	94	1	34	...	1	51	32	125	125	125	150	Morgan Smith, M.D., Dean	Sept. 14	May 13	3
	CALIFORNIA			**469**	**85**	**78**	**14**	**28**										
4	College of Physicians and Surgeons, San Francisco	416,912	C	31	3	7	1	2	24	36	165	160	160	185	C. O. Southard, M.D., Secretary	Sept. 2	June 4	4
5	Hahnemann Medical College of the Pacific, San Francisco.—H	416,912	B	40	...	5	...	...	38	34	155	109	100	100	James W. Ward, M.D., Dean	Aug. 11	April 29	5
6	Leland Stanford Junior Univ., School of Med., San Francisco	416,912	A+	60	15	9	3	11	93	34	160	155	150	150	Ray Lyman Wilbur, M.D., Dean	Sept. 2	May 17	6
7	University of California, College of Medicine, San Francisco	416,912	A+	98	26	10	3	10	76	36	195	180	165	165	Herbert C. Moffit, M.D., Dean	Aug. 7	May 8	7
8	California Eclectic Medical College, Los Angeles.—E	319,198	C	29	9	9	2	...	30	32	145	110	100	125	.....	.....	.....	8
9	College of Physicians and Surgeons, Los Angeles	319,198	B	143	10	32	2	4	78	36	177	172	160	175	Charles W. Bryson, M.D., Dean	Sept. 9	June 10	9
10	Oakland College of Medicine and Surgery, Oakland	150,174	B	12	3	2	1	...	44	36	210	200	175	175	Edward N. Fewer, M.D., Registrar	Aug. 18	May 22	10
11	College of Medical Evangelists, Loma Linda (b)	110	C	56	19	4	2	2	23	35	141	136	136	136	Alfred Shryock, M.D., Dean	Sept. 13	June 8	11
	COLORADO			**53**	**1**	**16**	**1**	**9**										
12	University of Colorado, School of Medicine, Boulder-Denver	213,381	A	53	1	16	1	9	73	35	75	75	75	75	William P. Harlow, M.D., Dean	Sept. 14	June 9	12
	CONNECTICUT			**49**	...	**8**	...	**8**										
13	Yale Medical School, New Haven	133,605	A+	49	...	8	...	8	66	35	223	170	153	163	George Blumer, M.D., Dean	Oct. 1	June 23	13
	DISTRICT OF COLUMBIA			**377**	**3**	**68**	**1**	**8**										
14	George Washington University Medical School, Washington	331,069	A	170	1	16	...	...	73	33	150	150	150	150	W. C. Borden, M.D., Dean	Sept. 30	June 9	14
15	Georgetown University, School of Medicine, Washington	331,069	A	99	...	21	...	...	87	34	165	150	150	150	George M. Kober, M.D., Dean	Sept. 25	June 13	15
16	Howard University, School of Medicine, Washington	331,069	A	108	2	31	1	8	39	32	107	102	102	109	Edward A. Balloch, M.D., Dean	Oct. 1	June 2	16
	GEORGIA			**646**	...	**186**	...	**7**										
17	Atlanta Medical College	154,839	A	488	...	125	...	4	112	32	150	150	150	150	W. S. Elkin, M.D., Dean	Sept. 28	June 1	17
18	Georgia College of Eclectic Medicine and Surgery, Atlanta.—E (c)	154,839	C	51	...	21	...	...	...	...	...	...	...	...	.....	.....	.....	18
19	Southern College of Medicine and Surgery, Atlanta (d)	154,839	C	49	...	20	...	...	...	...	...	...	...	...	.....	.....	.....	19
20	University of Georgia, Medical Department, Augusta (e)	41,040	A	58	...	20	...	3	47	34	150	150	150	150	W. H. Doughty, Jr., M.D., Dean	Sept. 16	June 1	20
	ILLINOIS			**2331**	**143**	**570**	**26**	**127**										
21	Bennett Medical College, Chicago	2,185,283	B	395	11	110	1	4	68	32	150	150	150	150	Maximilian Herzog, M.D., Dean	Sept. 30	May 28	21
22	Chicago College of Medicine and Surgery, Chicago	2,185,283	B	597	41	165	12	...	114	32	150	150	150	150	William J. Butler, M.D., Dean	Sept. 29	May 24	22
23	Chicago Hospital College of Medicine, Chicago	2,185,283	C	75	...	1	...	...	66	32	110	107	100	105	Edwin Pynchon, M.D., Dean	Sept. 1	May 1	23
24	Hahnemann Medical College and Hospital, Chicago.—H	2,185,283	B	78	14	15	2	...	78	32	146	131	165	187	Joseph P. Cobb, M.D., Dean	Sept. 28	May 27	24
25	Jenner Medical College, Chicago	2,185,283	C	183	16	8	3	3	60	37	145	140	120	155	John D. MacKellar, M.D., Secretary	Sept. 7	June 13	25
26	Northwestern University Medical School, Chicago	2,185,283	A+	180	...	60	...	27	139	33	190	195	150	206	Arthur R. Edwards, M.D., Dean	Sept. 29	June 6	26
27	Rush Medical College (University of Chicago)	2,185,283	A+	430	32	95	2	87	288	34	185	180	180	195	John M. Dodson, M.D., Dean	Oct. 1	June 19	27
28	University of Illinois, College of Medicine, Chicago	2,185,283	A	363	29	107	6	6	149	34	155	155	150	160	D. A. K. Steele, M.D., Dean	Oct. 1	June 11	28
	INDIANA			**128**	**5**	**20**	**2**	**10**										
29	Indiana University, School of Medicine, Indianapolis	233,650	A+	128	5	20	2	10	130	35	100	100	130	130	Charles P. Emerson, M.D., Dean	Sept. 29	June 23	29
	IOWA			**110**	**3**	**13**	...	**7**										
30	State University of Iowa, College of Medicine, Iowa City	16,091	A+	105	3	13	...	7	42	35	110	100	100	110	Lee Wallace Dean, M.D., Dean	Sept. 21	June 16	30
31	State Univ. of Iowa, Coll. of Homeopathic Medicine, Iowa City.—H	10,091	A	5	...	...	...	...	30	35	110	100	100	110	George Royal, M.D., Dean	Sept. 21	June 16	31
	KANSAS			**102**	**3**	**9**	**1**	**9**										
32	University of Kansas, School of Medicine, Rosedale	5,960	A	102	3	9	1	9	58	35	30	25	100	105	Merwin T. Sudler, M.D., Asso. Dean	Sept. 16	June 10	32
	KENTUCKY			**278**	...	**54**	...	**5**										
33	University of Louisville, Medical Department, Louisville	223,928	A	278	...	54	...	5	93	33	170	165	165	175	Henry Enos Tuley, M.D., Dean	Sept. 28	June 3	33
	LOUISIANA			**327**	...	**77**	...	**21**										
34	Tulane University of Louisiana, School of Medicine	339,075	A+	327	...	77	...	21	115	33	195	195	195	225	Isadore Dyer, M.D., Dean	Sept. 28	June 2	34
	MAINE			**67**	...	**19**	...	**9**										
35	Medical School of Maine, Portland	58,571	A	67	...	19	...	9	66	33	110	110	110	135	Addison S. Thayer, M.D., Dean	Oct. 15	June 24	35
	MARYLAND			**974**	**24**	**235**	**11**	**90**										
36	College of Physicians and Surgeons, Baltimore	558,485	A	184	...	58	...	...	69	32	165	165	165	195	William F. Lockwood, M.D., Dean	Oct. 1	June 1	36
37	Johns Hopkins University, Medical Department, Baltimore	558,485	A+	336	24	80	11	91	127	32	240	200	200	200	J. Whitridge Williams, M.D., Dean	Oct. 6	June 8	37
38	University of Maryland, School of Medicine, Baltimore	558,485	A	454	...	97	...	...	139	32	170	170	170	200	R. Dorsey Coale, M.D., Dean	Oct. 1	June 1	38

* From the Third Classification of Medical Colleges, revised to June 21, 1914. See page 669.

	MASSACHUSETTS			**783**	**53**	**152**	**9**	**70**											
39	Boston University, School of Medicine.—H	670,585	A	89	24	18	4	4	68	32	152	147	127	155	John P. Sutherland, M.D., Dean	Oct. 1	June 2	39
40	College of Physicians and Surgeons, Boston (f)	670,585	C	110	...	13	...	...	58	35	80	100	100	130	Thomas D. Crothers, M.D., Dean	Sept. 16	June 9	40
41	Medical School of Harvard University, Boston	670,585	A+	205	...	64	...	64	207	26	237	208	200	200	Edward H. Bradford, M.D., Dean	Sept. 28	June 24	41
42	Tufts College Medical School, Boston	670,585	A	279	32	57	5	2	122	32	155	155	155	155	Charles F. Painter, M.D., Dean	Sept. 30	May 30	42
	MICHIGAN			**578**	**26**	**110**	**2**	**32**											
43	Detroit College of Medicine and Surgery, Detroit	465,766	A	249	..	54	...	1	169	33	135	130	110	130	Frank B. Walker, M.D., Secretary	Sept. 21	June 3	43
44	University of Michigan, Dept. of Med and Surg., Ann Arbor (z)	14,817	A+	260	22	35	1	31	75	55	138	102	117	77	Victor C. Vaughan, M.D., Dean	Sept. 29	June 24	44
45	University of Michigan, Homeopathic College, Ann Arbor.—H (g)	14,817	A	69	4	21	1	...	18	35	138	102	117	77	W. B. Hinsdale, M.D., Dean	Sept. 29	June 24	45
	MINNESOTA			**162**	**7**	**28**	**2**	**26**											
46	University of Minnesota, Medical School, Minneapolis	301,408	A+	162	7	28	2	26	81	35	150	150	150	150	E. P. Lyon, M.D., Dean	Sept. 16	June 11	46
	MISSISSIPPI			**35**	...	...	...	...											
47	University of Mississippi, Department of Medicine, Oxford (h)	2,014	A	35	...	...	...	...	14	34	101	101	...	...	Walter S. Leathers, M.D., Dean	Sept. 17	June 1	47
	MISSOURI			**615**	**20**	**150**	**7**	**30**											
48	University of Missouri, School of Medicine, Columbia (h)	9,662	A+	52	3	...	...	...	15	34	40	40	...	...	Guy L. Noyes, M.D., Acting Dean	Sept. 14	June 3	48
49	Kansas City Hahnemann Medical College, Kansas City.—H	248,381	C	44	2	12	1	...	40	34	125	125	125	125	M. T. Runnels, M.D., Dean	Sept. 8	May 20	49
50	Eclectic Medical University, Kansas City.—E	248,381	C	59	6	12	2	...	20	30	100	100	100	100	.....	.....	.....	50
51	Ensworth Medical College, St. Joseph (i)	77,403	C	10	...	9	...	...	...	...	...	...	...	...	.....	.....	.....	51
52	American Medical College, St. Louis	687,039	C	141	5	31	3	1	13	34	140	135	135	135	James Moores Ball, M.D., Dean	Sept. 22	June 7	52
53	St. Louis University, School of Medicine, St. Louis	687,039	A	204	...	48	...	19	122	32	140	140	140	140	H. W. Loeb, M.D., Dean	Sept. 15	May 17	53
54	St. Louis College of Physicians and Surgeons, St. Louis (j)	687,039	C	44	4	23	1	...	...	...	...	...	...	...	.....	.....	.....	54
55	Washington University Medical School, St. Louis	687,039	A+	61	...	15	...	10	79	34	155	150	150	155	E. L. Opie, M.D., Dean	Sept. 24	June 10	55
	NEBRASKA			**281**	**14**	**40**	**2**	**11**											
56	John A. Creighton Medical College, Omaha	124,096	B	180	2	35	...	4	53	32	120	120	120	120	A. L. Muirhead, M.D., Dean	Sept. 1	April 30	56
57	University of Nebraska, College of Medicine, Omaha	124,096	A+	77	7	10	1	5	69	34	125	120	110	110	Irving S. Cutter, M.D., Secretary	Sept. 14	June 4	57
58	Cotner University Medical College, Lincoln.—E	43,973	C	24	5	4	1	2	33	33	100	100	100	100	R. L. Hoff, Registrar	Sept. 14	May 27	58
	NEW HAMPSHIRE			**23**	...	**6**	...	**5**											
59	Dartmouth Medical School, Hanover (h)	2,075	A	23	...	6	...	5	26	36	173	170	...	...	John M. Gile, M.D., Dean	Sept. 24	June 23	59
	NEW YORK			**2077**	**76**	**432**	**15**	**97**											
60	Albany Medical College, Albany	100,253	A	258	...	52	...	4	103	32	135	140	120	130	Joseph D. Craig, M.D., Registrar	Sept. 22	May 25	60
61	Columbia University, College of Phys. and Surg., New York	4,766,883	A+	308	...	71	...	54	209	33	255	250	250	275	Samuel W. Lambert, M.D., Dean	Sept. 23	June 2	61
62	Cornell University Medical College, New York City	4,766,883	A+	93	15	15	5	20	137	33	190	185	185	200	Wm. M. Polk, M.D., Dean	Sept. 30	June 10	62
63	Fordham University, School of Medicine, New York City	4,766,883	A	175	...	29	..	3	99	33	200	200	200	200	William P. Healy, M.D., Dean	Sept. 25	June 8	63
64	Long Island College Hospital, New York City	4,766,883	A	300	...	79	...	4	113	33	210	205	200	200	Joseph H. Raymond, M.D., Secretary	Sept. 22	June 7	64
65	New York Homeopathic Medical College and Flower Hospital.—H	4,766,883	A	237	..	43	...	...	85	32	165	160	150	180	Royal S. Copeland, M.D., Dean	Sept. 30	May 26	65
66	New York Medical College and Hospital for Women.—H	4,766,883	C	....	42	...	7	...	58	33	155	150	135	155	Cornelia C. Brant, M.D., Dean	Sept. 23	June 3	66
67	University and Bellevue Hospital Medical College, New York	4,766,883	A+	333	...	83	...	3	125	34	205	200	200	225	Samuel A. Brown, M.D., Secretary	Sept. 23	June 9	67
68	Syracuse University, College of Medicine, Syracuse	137,249	A+	92	4	15	1	9	73	35	192	187	187	207	John L. Heffron, M.D., Dean	Sept. 15	June 9	68
69	University of Buffalo, Medical Department, Buffalo	423,715	A	221	15	45	2	...	100	33	185	180	140	140	Herbert U. Williams, M.D., Dean	Sept. 21	June 4	69
	NORTH CAROLINA			**252**	**3**	**36**	...	**5**											
70	Leonard Medical School, Raleigh (h)	19,218	B	76	...	8	...	2	22	30	50	50	50	50	George H. Stoddard, M.D., Dean	Sept. 30	May 13	70
71	University of North Carolina, School of Med., Chapel Hill (h)	1,149	A	60	...	...	...	...	25	25	120	125	...	...	Isaac Hall Manning, M.D., Dean	Sept. 7	June 2	71
72	North Carolina Medical College, Charlotte (k)	34,014	C	88	3	28	...	3	...	...	...	...	...	...	.....	.....	.....	72
73	Wake Forest College School of Medicine, Wake Forest (h)	1,443	A	28	...	...	...	...	10	35	103	103	...	...	E. B. Earnshaw, M.D., Secretary	Sept. 1	May 21	73
	NORTH DAKOTA			**13**	**1**	...	...	...											
74	Univ. of No. Dakota, School of Med., University (Grand Forks) (h)	12,478	A	13	1	...	...	...	17	35	50	50	...	...	H. E. French, M.D., Dean	Sept. 22	June 16	74
	OHIO			**647**	**13**	**130**	**4**	**44**											
75	Cleveland College of Physicians and Surgeons, Cleveland	560,663	A	4	...	4	...	...	...	...	...	...	...	...	.....	.....	.....	75
76	Cleveland-Pulte Medical College, Cleveland.—H (l)	560,663	C	53	..	11	...	...	...	...	...	...	...	...	.....	.....	.....	76
77	Western Reserve University, School of Medicine, Cleveland	560,663	A+	153	...	20	...	30	90	33	162	153	150	155	F. C. Waite, Ph.D., Registrar	Oct. 1	June 7	77
78	Eclectic Medical College, Cincinnati.—E	363,591	B	82	5	18	1	5	35	32	120	120	120	120	John K. Scudder, M.D., Secretary	Sept. 10	May 10	78
79	Medical College of the University of Cincinnati	363,591	A+	55	5	12	2	7	137	34	155	150	170	175	Christian R. Holmes, M.D., Dean	Sept. 29	June 12	79
80	Ohio State University, College of Medicine, Columbus (m)	181,511	A+	281	3	53	1	2	76	34	150	150	125	125	William J. Means, M.D., Dean	Sept. 16	June 1	80
81	Toledo Medical College, Toledo (n)	169,497	C	19	...	2	...	...	...	...	...	...	...	...	.....	.....	.....	81
	OKLAHOMA			**94**	...	**14**	...	...											
82	Univ. of Oklahoma, School of Med., Norman and Oklahoma City.	64,205	B	94	...	14	...	...	56	34	37	24	10	10	Curtis R. Day, M.D., Dean, Oklahoma City	Sept. 22	June 10	82
	OREGON			**77**	**2**	**25**	**1**	**3**											
83	University of Oregon, Department of Medicine, Portland	207,214	A	77	2	25	1	3	62	32	150	150	150	150	Kenneth A. J. Mackenzie, M.D., Dean	Oct. 1	June 1	83
	PENNSYLVANIA			**1572**	**105**	**373**	**19**	**79**											
84	Hahnemann Medical College and Hospital, Philadelphia.—H	1,549,008	A	93	...	14	...	3	89	33	195	190	180	180	William A. Pearson, M.D., Dean	Sept. 21	June 3	84
85	Jefferson Medical College, Philadelphia	1,549,008	A+	648	...	147	...	17	157	33	200	200	200	200	Ross V. Patterson, M.D., Sub-Dean	Sept. 24	June 5	85
86	Medico-Chirurgical College of Philadelphia	1,549,008	A	350	...	75	...	...	114	33	162	159	155	153	Seneca Egbert, M.D., Dean	Sept. 21	June 4	86
87	Temple University, Department of Medicine, Philadelphia	1,549,008	B	90	11	17	1	...	97	34	150	150	150	150	Frank C. Hammond, M.D., Dean	Sept. 17	June 5	87
88	University of Pennsylvania, School of Medicine, Philadelphia (o)	1,549,008	A+	266	..	74	...	50	174	35	230	212	210	213	William Pepper, M.D., Dean	Sept. 25	June 16	88
89	Woman's Medical College of Pennsylvania, Philadelphia	1,549,008	A	....	93	...	18	5	61	34	187	181	178	180	Clara Marshall, M.D., Dean	Sept. 16	June 2	89
90	University of Pittsburgh, School of Medicine, Pittsburgh	533,905	A+	123	1	46	...	4	95	34	235	220	220	225	Thomas S. Arbuthnot, M.D., Dean	Sept. 28	June 16	90
	SOUTH CAROLINA			**104**	...	**19**	...	**6**											
91	Medical College of the State of South Carolina, Charleston	58,833	B	104	...	19	...	6	62	32	140	140	140	140	Robert Wilson, Jr., M.D., Dean	Oct. 1	June 3	91

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(*Concluded*)

Marginal Number.	NAME AND LOCATION OF COLLEGE	Population of city where college is located. (Census of 1910)	Classification by Council on Medical Education.*	No. of students registered 1913-14		Graduates 1914		Grads. with A.B., B.S. or Ph.B.	No. of teachers.	Weeks in college year.	Total Fees (Dollars).				Executive Officer	Session of 1914-15		Marginal Number.
				Men.	Women.	Men.	Women.				1st year.	2d year.	3d year.	4th year.		Begins 1914	Ends 1915	
	SOUTH DAKOTA			**14**	...	...	...	...										
92	University of South Dakota, College of Medicine, Vermilion (h)..	2,187	A	14	...	...	...	...	9	35	60	60	...	...	Christian P. Lommen, Dean.....	Sept. 15	June 10	92
	TENNESSEE			**1197**	**12**	**258**	**1**	**18**										
93	Lincoln Memorial University, Medical Department, Knoxville (p)..	36,346	C	74	1	19	...	1	...	...	...	...	...	...	.....	.....	.....	93
94	Meharry Medical College, Nashville.....	110,364	B	353	6	72	1	11	28	29	70	70	70	80	George W. Hubbard, M.D., Dean.....	Sept. 9	April 20	94
95	Vanderbilt University, Medical Department, Nashville.....	110,364	A+	381	...	65	...	...	67	36	150	150	150	175	Lucius C. Burch, M.D., Acting Dean.....	Sept. 16	June 16	95
96	University of Tennessee, College of Medicine, Memphis.....	131,105	A	316	5	77	...	4	103	33	125	125	125	150	Herbert T. Brooks, M.D., Dean.....	Sept. 22	June 4	96
97	University of West Tennessee, Coll. of Med. and Surg., Memphis..	131,105	C	73	...	25	...	3	21	30	55	55	55	65	M. V. Lynk, M.D., Dean.....	Sept. 14	May 1	97
	TEXAS			**306**	**15**	**66**	**3**	**12**										
98	Texas Christian University, School of Medicine, Fort Worth.....	73,312	B	48	...	11	...	1	47	33	114	113	108	125	I. C. Chase, M.D., Dean.....	Sept. 8	June 4	98
99	University of Texas, Department of Medicine, Galveston.....	36,981	A+	160	12	20	3	11	29	32	75	50	28	10	W. S. Carter, M.D., Dean.....	Oct. 1	May 31	99
100	Baylor University, College of Medicine, Dallas.....	92,104	B	48	2	18	...	...	46	32	120	115	115	125	E. H. Cary, M.D., Dean.....	Sept. 30	May 31	100
101	Southern Methodist University, Medical Department, Dallas.....	92,104	B	50	1	17	...	...	38	32	113	108	103	125	John O. McReynolds, M.D., Dean.....	Sept. 30	June 3	101
	UTAH			**19**	**1**	...	...	...										
102	University of Utah, School of Medicine, Salt Lake City (h).....	92,777	A	19	1	...	...	...	19	34	64	66	...	...	J. T. Kingsbury, President.....	Sept. 14	June 3	102
	VERMONT			**117**	...	**39**	...	**2**										
103	University of Vermont, College of Medicine, Burlington.....	20,468	A	117	...	39	...	2	44	36	145	145	145	170	H. C. Tinkham, M.D., Dean.....	Sept. 23	June 23	103
	VIRGINIA			**493**	...	**105**	...	**17**										
104	Medical College of Virginia, Richmond.....	127,628	A	386	...	88	...	10	123	34	164	114	114	144	Stuart McGuire, M.D., Dean.....	Sept. 15	June 1	104
105	University of Virginia, Department of Med., Charlottesville.....	6,765	A+	104	...	17	...	7	35	36	140	140	140	140	R. H. Whitehead, M.D., Dean.....	Sept. 14	June 16	105
	WEST VIRGINIA			**18**	**3**	...	...	...										
106	West Virginia University, School of Medicine, Morgantown (h)....	9,150	B	18	3	...	...	...	11	36	60	40	...	...	John N. Simpson, M.D., Dean.....	Sept. 14	June 16	106
	WISCONSIN			**243**	**9**	**43**	...	**4**										
107	Marquette University School of Medicine, Milwaukee.....	373,857	B	167	2	43	...	4	116	34	180	175	175	175	Louis F. Jermain, M.D., Dean.....	Oct. 1	June 17	107
108	University of Wisconsin Medical School, Madison (h).....	25,531	A+	76	7	...	...	...	25	35	170	170	...	...	Charles R. Bardeen, M.D., Dean.....	Sept. 23	June 18	108
	PHILIPPINE ISLANDS			**80**	**12**	**7**	**2**	**3**										
109	Univ. of the Philippines, College of Med. and Surg., Manila (q)....	234,409	....	80	12	7	2	3	66	36	...	...	...	...	William E. Musgrave, M.D., Dean.....	July 1	Mar. 30	109
	CANADA			**1758**	**33**	**320**	**1**	**25**										
110	University of Alberta, Medical Faculty, Edmonton, Alta. (r).....	24,900	....	26	...	...	...	...	7	30	50	75	...	...	Cecil E. Race, B.A., Registrar.....	Sept. 30	May 12	110
111	Dalhousie University, Faculty of Medicine, Halifax, N. S. (s).....	46,619	....	70	5	14	1	6	37	32	100	100	100	100	A. W. H. Lindsay, M.D., Secretary.....	Sept. 9	May 6	111
112	Queen's University, Faculty of Medicine, Kingston, Ont. (s).....	18,874	....	268	...	50	...	...	39	31	105	105	105	135	J. C. Connell, M.D., Dean.....	Sept. 14	April 28	112
113	Western University, Medical Faculty, London, Ont. (s).....	46,300	....	90	...	27	...	1	37	32	110	110	110	110	H. A. McCallum, M.D., Dean.....	Oct. 1	June 5	113
114	McGill University, Faculty of Medicine, Montreal, Que. (s).....	470,480	....	382	...	63	...	12	120	32	164	164	164	191	John W. Scane, M.D., Registrar.....	Oct. 1	June 8	114
115	Montreal School of Medicine and Surgery, Montreal, Que. (s).....	470,480	....	121	...	22	...	...	60	33	110	118	126	138	E. P. Lachapelle, M.D., Dean.....	Oct. 1	June 19	115
116	Laval University, Medical Faculty, Quebec, Que. (s).....	78,190	....	88	...	14	...	...	24	36	60	60	60	60	Michael J. Ahern, M.D., Dean.....	Sept. 1	June 1	116
117	University of Toronto, Faculty of Medicine, Toronto, Ont. (s).....	376,538	....	520	24	85	...	2	183	32	150	150	150	150	A. Primrose, M.D., Secretary.....	Sept. 29	May 29	117
118	University of Manitoba, Manitoba Medical College, Winnipeg (s)..	136,036	....	184	4	45	...	4	58	33	155	150	150	150	H. H. Chown, M.D., Dean.....	Sept. 21	May 1	118

* From the Third Classification of Medical Colleges, revised to June 21, 1914. See page 669.

REFERENCES

(a) After the one remaining class has been graduated, this college will discontinue undergraduate medical teaching.

(b) Gives a five-year course, including a number of theological, non-medical subjects.

(c) It is rumored that this college has been suspended.

(d) Reported closed following withdrawal of recognition by the Georgia State Board of Medical Examiners.

(e) No tuition fees charged by this college for students who are bona fide residents of Georgia.

(f) Catalogue contains names of 228 "matriculants and applicants," including dental students. The number of medical students actually in attendance is approximately as given.

(g) Fees given are as charged for non-residents; they are $10 less each year for residents of Michigan.

(h) These colleges give only the work of the first two years of the medical course.

(i) This college has been closed.

(j) No information obtained as to whether this college will reopen or not.

(k) This college has been merged with the Medical College of Virginia at Richmond.

(l) Reported to have transferred its property to the Ohio State University.

(m) This college was formerly the Starling-Ohio Medical College.

(n) Reported closed following withdrawal of recognition by the Ohio State Medical Board.

(o) This medical school will admit women students hereafter.

(p) This college has merged with the University of Tennessee College of Medicine at Memphis.

(q) This medical school is controlled and financed by the government. No tuition fees are charged.

(r) Gives only the work of the first two years of the Canadian five-year course, which corresponds to the preliminary college science year and the first medical year in the United States.

(s) All these colleges give a five-year course, which includes a year of preliminary science work. This is the equivalent of the course given by the fifty medical schools in the United States which require one year of college preliminary science work for entrance. The course is surpassed by thirty-four medical colleges in the United States which require two years of collegiate work for admission.

CONTINUED FROM PAGE 671

TEXAS

Texas Christian University, School of Medicine 1914
University of Texas, Department of Medicine 1910
Baylor University, College of Medicine 1913
Southern Methodist University, Medical Department..... 1914

VERMONT

University of Vermont, College of Medicine..... 1912

VIRGINIA

Medical College of Virginia 1914
University of Virginia, Department of Medicine..... 1910

WEST VIRGINIA

West Virginia University, School of Medicine 1911

WISCONSIN

Marquette University, School of Medicine 1914

The five following medical colleges shown in the above list as now requiring one year of collegiate work for admission have announced that all students admitted in the session of 1915-16 and thereafter will be required to have completed *two years* of such collegiate work.

University of Alabama, School of Medicine.
Ohio State University, College of Medicine.
Woman's Medical College of Pennsylvania.
Medical College of Virginia.
Marquette University, School of Medicine.

The Medical Department of the University of Arkansas and the Hahnemann Medical College of the Pacific announce that all students admitted in 1915-16 will be required to present at least one year of collegiate work or enter on a five-year course including a preliminary year of college physics, chemistry and biology.

Hospital Intern Year

Three medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the sessions when the requirement became effective are as follows:

University of Minnesota, Medical School.....1910-11
Leland Stanford Jr. University, School of Medicine.....1914-15
Rush Medical College.....1914-15

One state licensing board, that of Pennsylvania, now requires that every candidate to be eligible for license to practice medicine in that state, must have served at least one year as an intern in an approved hospital. The requirement became effective in 1914.

Graduate Courses in Public Health

Graduate courses in public health have been established in connection with seven medical schools leading to a degree of Doctor of Public Health (Dr.P.H.), Certified Sanitarian (C.S.), Master of Science in Public Health (M.S.(P.H.)) or Master of Public Health (M.P.H.). The course is for one year except at the Universities of Michigan, Minnesota and Wisconsin where the course for the Doctorate covers two years. Wisconsin gives a Diploma in Public Health (D.P.H.) for a one-year course. These colleges are as follows:

MEDICAL COLLEGES GIVING COURSES IN PUBLIC HEALTH

Name of College	Course started in	Degree granted	Years in Course	Degrees required for entrance	Fees
Univ. of Penn. Sch. of Med.	1909	Dr.P.H....	1	M.D.	$150
		C.S.....	1	A.B. or B.S.	150
Med. Sch. of Harvard Univ.	1910	Dr.P.H....	1	A.B., or B.S.	†
Univ. of Mich. Dept. M. & S.	1912	M.S.(P.H.)	1	A.B. or B.S. and M.D.	87*
		Dr.P.H....	2		139*
Univ. of Wis. Med. School..	1912	D.P.H.....	1	M.D.	104‡
		Dr.P.H....	2	M.D.	188‡
Detroit College of M. & S..	1913	M.P.H.....	1	M.D.	60
Univ. & Bell. Hosp. M. C.	1914	Dr.P.H....	1	M.D.	200
Tulane Univ., Sch. of Med..	1914	Dr.P.H....	1	M.D.	†
Univ. of Minn. Med. School.	1914	Dr.P.H....	2	M.D.	†

* For residents of Michigan the fees for the one- and the two-year courses, respectively are $62 and $104. ‡ For residents of Wisconsin the fees are $70 less each year. † Information not obtained.

State University Medical Schools

Twenty-eight states now have medical schools as integral parts of the state universities or—in one instance—under state control as separate institutions. These states and other interesting data regarding the medical schools are as follows:

STATE UNIVERSITY MEDICAL SCHOOLS

Medical School of State University of	Only School in State	Length of Med. Course in Years.	Years of College Work for Admission.	Medical School of State University of	Only School in State	Length of Med. Course in Years.	Years of College Work for Admission.
Alabama.....	1915	4	1[2]	North Carolina..	.....	4[2]	1
Arkansas	Yes	4	..[3]	North Dakota...	Yes	4[2]	2[3]
California.....	.....	4	2	Ohio.....	.....	4	1[2]
Colorado.....	Yes	4	2[3]	Oklahoma.....	Yes	4	1
Georgia.....	.....	4	1	Oregon.....	Yes	4	1
Illinois.....	.....	4	2	South Carolina.	Yes	4	1
Indiana.....	Yes	4	2[3]	South Dakota...	Yes	2	2[3]
Iowa*.....	Yes	4	2[3]	Tennessee.....	.....	4	1
Kansas.....	Yes	4	2	Texas.....	.....	4	1
Michigan*.....	.....	4	2	Utah.....	Yes	2	2
Minnesota.....	Yes	5	2[3]	Vermont.....	Yes	4	1
Mississippi.....	Yes	2	1	Virginia.....	.....	4	1
Missouri.....	.....	2	2	West Virginia...	Yes	2	1
Nebraska.....	.....	4	2	Wisconsin.....	.....	2	2

* Have Homeopathic Departments.
1. To require 1 year in 1915
2. To require 2 years in 1915.
3. Similar requirements by Licensing Board.

In fifteen states no other medical schools exist, medical education in the state being entirely in charge of the state university. This will be true in Alabama also in 1915, when an independent medical school now existing will give only post-graduate instruction.

Of the twenty-eight state medical schools, twenty give the complete medical course and grant M.D. degrees while eight give only the first two years of the medical course. Minnesota requires a five-year course, the fifth year to be spent by the student in a hospital as an intern, or in other recognized clinical work. The universities of Iowa and Michigan have Homeopathic departments and one is contemplated also in Ohio. In Iowa the entrance requirements are the same for the two departments, but in Michigan, while for the regular department two years of collegiate work are required for entrance, only one year is required for the Homeopathic College; nevertheless, the students of the two colleges are taught together in the work of the first two years.

As may be noted, fourteen of these state university medical schools are now requiring for admission two years of collegiate work. The medical schools of the University of Alabama and the Ohio State University have announced the two-year requirement to take effect in 1915. As already shown the state schools are supported in this requirement by the state licensing boards in Colorado, Indiana, Iowa, Minnesota, North Dakota and South Dakota. This will be true also in Alabama in 1915. Of the twelve remaining state university medical schools all but the University of Arkansas are now requiring for admission a standard four-year high-school course and in addition one year of collegiate work. The one year requirement becomes effective in Arkansas also in 1915 both for the Medical School and the State Licensing Board.

The Combined Course in Liberal Arts and Medicine

There are fifty-six medical schools which announce that arrangements have been made whereby students can secure degrees in both arts and medicine in six or seven years' time. Many have arranged for the B.S. and M.D. degrees in six years, or the A.B. and M.D. degrees in seven years. Nine of these colleges give only the first two years of the medical course and, therefore, offer only the first four or five years of the combined course. These are indicated by the figures four and five in parentheses. The list of medical schools follows:

CONTINUED ON PAGE 678

Marginal Number.	NAME OF COLLEGE	1 Alabama.....280	2 Arizona.....10	3 Arkansas.....177	4 California.....396	5 Colorado.....87	6 Connecticut.....189	7 Delaware.....22	8 Dist. of Col.....101	9 Florida.....127	10 Georgia.....598	11 Idaho.....30	12 Illinois.....1,298	13 Indiana.....350	14 Iowa.....322	15 Kansas.....241	16 Kentucky.....206	17 Louisiana.....212	18 Maine.....114	19 Maryland.....252	20 Massachusetts..701	Marginal Number.
1	Birmingham Medical College, Birmingham	56	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1
2	University of Alabama, School of Med., Mobile	88	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2
3	University of Arkansas, Medical Dept., Little Rock	1	....	80	1	....	....	....	....	....	....	....	....	....	....	1	....	3	....	....	....	3
4	College of Phys. and Surgs., San Francisco	....	....	1	11	....	....	....	....	....	....	....	2	....	2	3	....	....	....	....	....	4
5	Hahnemann Medical College of the Pacific.—H*	....	....	....	40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
6	Leland Stanford Junior Univ., School of Medicine	....	....	....	60	1	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	6
7	Univ. of California, Coll. of Med., San Francisco	....	....	....	114	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	7
8	California Eclectic Med. Coll., Los Angeles.—E	....	....	....	38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
9	College of Physicians and Surgeons, Los Angeles	....	1	1	29	3	1	....	1	....	1	....	14	6	13	3	2	....	....	....	1	9
10	Oakland College of Med. and Surg., Oakland	....	....	....	14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
11	College of Medical Evangelists, Loma Linda	....	2	....	18	1	....	....	1	1	....	....	1	3	2	....	....	....	....	....	....	11
12	Univ. of Colorado, School of Med., Boulder-Denver	....	1	1	....	37	....	....	....	....	....	2	1	1	1	....	....	....	....	....	....	12
13	Yale Medical School, New Haven	....	....	....	....	....	36	....	....	....	....	....	1	....	....	....	....	....	....	....	1	13
14	George Washington University, Med. School	....	....	....	2	1	4	....	46	1	1	....	5	1	....	....	....	2	1	3	4	14
15	Georgetown University, School of Medicine	....	....	....	....	1	7	....	22	....	1	....	....	....	....	....	....	....	1	4	21	15
16	Howard University, School of Med., Washington	2	....	3	....	....	....	....	14	4	4	....	1	....	....	....	3	2	....	6	....	16
17	Atlanta Medical College	40	....	....	1	....	....	....	....	37	303	....	....	....	1	....	1	....	....	....	....	17
18	Georgia College of Eclectic Med. and Surg.—E	....	....	....	....	....	....	....	....	....	51	....	....	....	....	....	....	....	....	....	....	18
19	Southern College of Med. and Surg., Atlanta	....	....	....	....	....	....	....	....	....	40	....	....	....	....	....	....	....	....	....	....	19
20	University of Georgia, Med. Dept., Augusta	....	....	....	....	....	....	....	....	3	50	....	....	....	....	....	....	....	....	....	....	20
21	Bennett Medical College, Chicago	....	....	1	2	....	3	....	....	1	1	1	211	15	8	2	2	2	3	1	1	21
22	Chicago College of Medicine and Surgery, Chicago	11	2	3	4	2	2	1	1	3	....	2	107	29	21	7	9	5	3	1	5	22
23	Chicago Hospital College of Med., Chicago*	....	....	....	....	....	....	....	....	....	....	....	75	....	....	....	....	....	....	....	....	23
24	Hahnemann Med. Coll. and Hosp., Chicago.—H	....	....	....	....	1	....	....	....	....	....	1	37	9	8	3	....	....	1	....	1	24
25	Jenner Medical College, Chicago	1	....	2	....	1	....	....	....	1	....	....	58	8	6	4	3	....	1	....	4	25
26	Northwestern University Medical School, Chicago	....	....	1	....	3	....	....	....	1	1	1	72	3	13	6	....	1	....	....	1	26
27	Rush Medical College (University of Chicago)	3	2	1	5	7	....	1	1	....	1	3	174	15	36	11	3	1	1	....	1	27
28	University of Illinois, College of Medicine, Chicago	1	....	....	....	4	....	....	1	....	2	4	207	16	18	12	....	1	1	....	2	28
29	Indiana University, School of Med., Indianapolis	1	....	....	....	....	....	....	....	....	....	....	....	127	....	....	1	....	....	....	....	29
30	State Univ. of Iowa, College of Med., Iowa City	....	....	....	....	....	....	....	....	2	....	....	1	....	98	....	....	....	....	....	....	30
31	State Univ. of Iowa., College of Homeo. Med.—H	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	31
32	Univ. of Kansas, School of Med., Kansas City	....	....	....	....	....	....	....	....	....	....	....	1	....	....	96	....	....	....	....	....	32
33	University of Louisville, Med. Dept., Louisville	3	1	4	2	....	1	....	....	4	6	....	17	45	5	3	107	5	....	....	....	33
34	Tulane University of Louisiana, School of Medicine	34	....	11	1	1	....	....	....	11	8	....	1	1	....	1	3	130	....	....	....	34
35	Medical School of Maine, Portland	....	....	....	....	....	3	....	....	....	....	....	....	....	1	....	....	....	56	....	4	35
36	College of Physicians and Surgeons, Baltimore	....	....	....	....	....	9	....	....	1	1	....	1	....	....	....	....	....	....	29	11	36
37	Johns Hopkins University, Med. Dept., Baltimore	13	....	....	11	....	5	2	2	1	16	....	10	6	6	4	7	3	....	59	14	37
38	University of Maryland, School of Medicine	2	1	1	2	....	13	1	2	6	4	....	1	....	....	....	....	1	1	127	21	38
39	Boston University, School of Medicine.—H	....	....	....	1	....	1	....	....	....	....	....	....	....	....	1	....	....	5	....	66	39
40	College of Physicians and Surgeons, Boston†	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	110	40
41	Medical School of Harvard University, Boston	1	....	....	12	9	6	1	1	....	3	....	7	3	5	2	1	1	13	3	123	41
42	Tufts College Medical School, Boston	....	1	....	....	....	11	....	....	....	2	....	....	....	1	....	....	....	11	....	242	42
43	Detroit College of Medicine and Surg., Detroit	....	....	....	....	....	....	....	....	....	....	....	2	9	....	....	....	....	....	....	....	43
44	Univ. of Michigan, Dept. of Med. and Surg	1	....	....	3	....	1	....	1	....	8	2	8	8	3	3	3	....	....	....	3	44
45	Univ. of Michigan, Homeo. Medical College.—H	....	....	....	....	....	....	....	....	....	....	....	3	3	3	2	1	....	....	2	....	45
46	University of Minnesota, Medical School	....	....	....	....	....	....	....	....	....	....	2	2	1	5	1	....	....	....	....	....	46
47	University of Mississippi, Dept. of Med., Oxford	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	47
48	University of Missouri, School of Med., Columbia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	48
49	Kansas City Hahnemann Medical College.—H	....	....	....	....	....	....	....	....	....	....	....	1	....	1	9	....	....	....	....	....	49
50	Eclectic Medical University, Kansas City	....	....	5	....	....	....	....	....	....	....	....	....	....	....	17	....	....	....	....	....	50
51	Ensworth Medical College, St. Joseph	....	....	....	....	....	....	....	....	....	....	....	1	....	....	5	....	....	....	....	....	51
52	American Medical College, St. Louis	1	....	1	....	....	....	....	....	....	....	2	36	1	....	4	2	....	....	....	....	52
53	St. Louis University, School of Medicine	....	....	1	1	1	2	....	....	....	....	1	41	11	8	8	1	1	1	....	....	53
54	St. Louis College of Physicians and Surgeons*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	54
55	Washington University Medical School, St. Louis	....	....	1	....	....	....	....	....	....	....	1	9	....	2	1	....	....	....	....	....	55
56	John A. Creighton Medical College, Omaha	....	1	....	....	1	....	....	....	....	....	....	3	....	25	6	....	....	....	....	....	56
57	University of Nebraska, College of Med., Omaha	....	....	1	....	1	....	....	....	....	....	....	....	....	6	....	1	....	....	....	....	57
58	Cotner University Medical College.—E	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	58
59	Dartmouth Medical School, Hanover	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	10	59
60	Albany Medical College, Albany	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	8	60
61	Columbia University, Col. of Phys. and Surgs	2	....	1	2	3	10	....	1	....	7	1	2	1	2	1	....	....	2	1	3	61
62	Cornell Univ. Medical College, New York City	....	....	....	2	....	6	....	1	....	....	1	....	....	1	....	....	....	....	....	3	62
63	Fordham Univ., School of Med., New York City	....	....	....	....	....	10	1	....	1	....	....	1	1	....	....	....	....	....	....	2	63
64	Long Island College Hospital, New York City	....	....	....	....	....	3	....	....	....	....	....	1	....	....	....	....	....	....	....	3	64
65	New York Homeo. Med. Coll. and Flower Hosp.—H	....	....	....	2	....	4	....	....	....	1	....	2	....	....	....	....	....	1	....	1	65
66	New York Med. Coll. and Hosp. for Women.—H	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	66
67	Univ. and Bellevue Hosp. Med. Coll., New York	....	....	....	....	....	10	....	1	....	....	....	1	....	....	....	....	....	....	....	2	67
68	Syracuse University, Coll. of Med., Syracuse	....	....	....	....	....	1	....	....	....	....	....	1	....	....	1	....	....	....	....	....	68
69	University of Buffalo, Medical Dept., Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	69
70	Leonard Medical School, Raleigh	1	....	....	....	....	....	....	1	5	5	....	....	....	....	....	....	....	....	....	....	70
71	Univ. of No. Carolina, School of Med., Chapel Hill	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	71
72	North Carolina Medical College, Charlotte	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	72
73	Wake Forest College School of Med., Wake Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	73
74	University of North Dakota, School of Med.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	74
75	Cleveland-Pulte Medical College, Cleveland.—H	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75
76	Western Reserve University, School of Medicine	....	....	....	1	....	....	....	....	....	....	....	3	2	3	2	1	....	....	....	....	76
77	Eclectic Medical College, Cincinnati.—E	....	....	1	1	....	....	....	....	....	....	....	1	3	....	4	....	....	....	....	....	77
78	Medical College of the University of Cincinnati	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	7	....	....	....	....	78
79	Ohio State Univ., Coll. of Med., Columbus	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	1	79
80	Toledo Medical College, Toledo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	80
81	University of Oklahoma, School of Med., Norman	7	....	3	....	....	....	....	....	....	....	....	2	....	....	8	....	....	....	....	1	81
82	University of Oregon, Dept. of Med., Portland	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	82
83	Hahnemann Medical College and Hospital.—H	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	83
84	Jefferson Medical College, Philadelphia	3	1	2	5	....	15	7	....	5	6	3	5	3	2	3	3	1	5	3	10	84
85	Medico-Chirurgical College of Philadelphia	1	....	....	2	....	2	4	1	....	1	....	1	2	....	....	....	....	....	1	1	85
86	Temple University, Dept. of Medicine, Philadelphia	....	....	....	....	....	2	....	1	....	....	....	1	....	....	....	....	....	....	2	1	86
87	University of Pennsylvania, School of Medicine	2	....	....	2	2	....	2	....	....	3	3	1	4	3	2	2	2	....	2	2	87
88	Woman's Medical College of Pennsylvania	....	....	1	....	....	2	....	....	....	....	....	....	....	2	....	....	....	....	....	3	88
89	Univ. of Pittsburgh, School of Med., Pittsburgh	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	89
90	Medical College of the State of South Carolina	....	....	....	....	....	....	....	....	3	1	....	....	....	....	....	....	....	....	....	....	90
91	Univ. of South Dakota, Coll. of Med., Vermilion	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	91
92	Lincoln Memorial Univ., Med. Dept., Knoxville*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	92
93	Meharry Medical College, Nashville	27	....	12	....	1	....	....	1	15	23	....	5	....	1	2	13	12	....	3	1	93
94	Vanderbilt University, Med. Dept., Nashville	41	2	8	1	3	....	....	....	12	19	....	7	3	....	....	24	12	....	....	....	94
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

* Information showing distribution not obtained. † Number of students, approximate. H.—Homeopathic. E.—Eclectic.

Marginal Number.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Marginal Number
	Michigan.....479	Minnesota.....392	Mississippi.....279	Missouri.....528	Montana.....80	Nebraska.....277	Nevada.....3	New Hampshire..42	New Jersey.....852	New Mexico.....7	New York.....2,100	North Carolina.475	North Dakota...62	Ohio.....791	Oklahoma.....128	Oregon.....103	Pennsylvania.1,841	Rhode Island....76	South Carolina.271	South Dakota...50	Tennessee.....499	Texas.....573	Utah.....55	Vermont.....83	Virginia.....427	Washington....88	West Virginia...292	Wisconsin.....299	Wyoming.....11	Philippines, etc.126	Foreign.....555	Totals.....16,502	
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	57	1
2	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	94	2
3	....	....	1	1	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	7	34	3
4	1	....	....	1	....	....	1	....	....	....	2	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	40	4
5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75	5
6	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	3	....	....	....	1	....	....	2	1	....	....	....	1	....	1	1	124	6
7	....	....	....	....	....	....	2	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	38	7
8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	153	8
9	5	6	....	7	....	7	....	....	1	....	7	....	1	6	....	....	7	....	....	1	1	1	2	....	....	....	1	4	....	1	20	15	9
10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	11	75	10
11	2	2	....	2	1	5	....	....	1	2	1	....	....	1	2	1	....	....	....	....	1	7	....	....	....	1	....	1	1	....	1	54	11
12	1	1	....	2	....	....	....	....	....	....	....	....	....	2	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	49	12
13	1	....	....	....	....	....	....	1	2	....	4	....	....	1	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	171	13
14	1	2	....	....	....	1	....	....	5	....	32	2	....	2	1	....	12	3	1	....	1	....	....	....	16	1	1	4	....	5	10	99	14
15	1	....	....	....	....	....	....	....	4	....	6	1	....	4	....	....	4	8	1	....	1	....	....	....	2	2	1	....	....	1	6	110	15
16	....	....	1	1	....	....	....	....	4	....	4	9	1	1	....	....	4	....	9	....	4	7	....	1	13	....	....	....	....	....	13	113	16
17	....	....	14	1	....	....	....	....	....	....	5	20	....	....	....	....	1	1	25	....	7	3	....	1	2	....	....	....	....	....	6	488	17
18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	51	18
19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	49	19
20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	58	20
21	17	8	1	11	1	3	....	....	2	....	10	2	....	6	6	....	12	1	....	....	1	3	1	....	4	....	11	15	....	27	10	406	21
22	19	19	3	10	9	6	....	....	2	....	39	2	7	22	9	1	31	....	....	2	2	9	3	1	4	4	17	40	....	24	35	638	22
23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75	23
24	6	4	....	1	....	2	....	....	....	....	....	....	....	5	1	1	2	....	....	....	....	....	....	....	....	....	....	4	....	....	5	92	24
25	6	3	....	1	....	3	....	....	1	....	14	....	....	4	....	2	6	....	....	....	1	4	....	1	....	1	....	4	....	....	61	199	25
26	6	12	....	1	....	2	....	....	....	1	1	....	9	5	1	2	....	....	....	8	....	2	2	....	1	5	1	14	....	....	4	180	26
27	7	22	3	10	7	9	....	....	2	1	5	....	12	28	2	4	1	....	1	6	4	6	9	1	2	5	2	39	....	1	7	462	27
28	18	25	....	6	3	7	....	....	1	....	3	....	....	6	4	1	2	2	....	9	1	2	1	....	....	5	....	34	....	6	17	422	28
29	1	....	....	....	....	....	....	....	....	....	1	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	133	29
30	....	2	....	2	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	108	30
31	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	31
32	....	....	....	7	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	105	32
33	1	....	6	4	....	....	....	....	1	....	....	4	1	1	6	....	8	....	2	....	3	13	....	....	2	1	14	2	1	2	3	278	33
34	....	1	46	9	....	....	....	....	....	....	1	4	1	....	6	1	....	....	2	....	1	43	....	....	....	....	2	8	....	....	1	327	34
35	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	17	67	35
36	....	....	....	....	....	....	....	....	13	....	6	....	4	4	1	....	30	6	....	....	....	2	3	....	7	1	38	....	....	....	184	184	36
37	2	4	3	8	....	2	....	2	11	....	26	11	2	24	1	8	40	1	8	3	3	5	....	....	17	2	5	5	....	3	5	360	37
38	....	....	1	1	....	....	....	4	15	....	34	55	....	3	....	....	37	5	25	....	....	1	2	2	22	2	21	....	....	25	18	454	38
39	....	....	1	....	....	....	....	3	2	....	5	1	....	1	....	....	3	2	1	....	....	....	....	2	2	....	1	....	....	....	15	113	39
40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	110	40
41	....	4	....	.6	....	....	....	4	2	....	18	4	1	9	1	1	15	16	....	2	1	4	3	2	1	....	2	7	....	1	10	305	41
42	....	....	....	....	....	....	....	10	....	....	2	....	....	1	....	....	2	14	....	....	....	....	....	3	....	1	....	....	....	1	9	311	42
43	196	1	....	....	....	....	....	....	....	....	2	....	....	10	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	25	249	43
44	134	3	....	2	....	4	....	1	2	....	22	1	....	23	....	3	13	....	1	....	2	1	....	1	....	6	2	2	....	4	11	282	44
45	30	1	....	....	....	....	....	....	....	....	9	....	....	10	1	....	3	....	....	....	....	....	....	....	....	....	1	....	....	....	3	73	45
46	....	128	....	1	....	1	....	....	....	....	1	....	6	1	....	....	1	....	....	1	....	....	....	....	....	8	....	8	....	....	2	169	46
47	....	....	35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	35	47
48	....	....	....	52	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	55	48
49	....	....	....	27	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	4	46	49
50	....	....	....	43	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	65	50
51	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	51
52	....	....	2	84	....	....	....	....	....	....	....	....	....	2	3	....	1	....	....	....	1	3	....	....	....	....	2	....	....	....	1	146	52
53	3	5	....	76	....	6	....	....	....	....	1	1	....	5	6	1	2	....	....	1	....	2	....	....	....	8	....	6	....	....	4	204	53
54	....	....	....	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	48	54
55	1	....	....	41	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	1	....	61	55
56	....	12	....	9	4	102	....	....	....	....	1	....	....	2	....	....	1	....	....	4	....	....	1	....	....	2	....	....	4	1	3	182	56
57	....	1	....	....	....	71	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	84	57
58	....	....	....	....	....	29	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	29	58
59	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	23	59
60	1	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	258	60
61	2	2	1	3	....	2	....	1	25	1	195	5	....	3	2	1	8	2	1	....	1	1	3	1	4	1	....	2	....	....	2	308	61
62	....	....	....	....	....	....	....	....	10	....	71	1	....	3	....	....	2	1	....	....	1	....	2	....	....	....	1	....	....	1	1	108	62
63	....	....	....	....	....	....	....	....	9	....	101	....	....	1	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	4	39	175	63
64	....	....	....	....	....	....	....	....	9	....	327	....	....	1	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	4	360	64
65	....	....	....	....	....	....	....	1	28	....	178	....	....	....	....	....	7	....	....	....	1	1	....	4	....	....	....	....	1	....	5	237	65
66	....	....	....	....	....	....	....	....	6	....	27	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	42	66
67	....	....	1	1	....	....	....	....	56	....	250	....	....	2	....	....	1	....	....	....	....	....	....	1	1	....	....	1	....	2	3	333	67
68	....	....	....	....	....	....	....	....	1	....	82	....	....	....	....	....	5	....	....	....	....	1	....	....	....	....	....	....	....	....	4	96	68
69	....	....	....	....	....	....	....	....	....	....	226	....	....	....	....	....	5	....	....	....	1	....	....	....	....	....	....	....	....	....	2	236	69
70	....	....	1	....	....	....	....	....	....	....	5	24	....	....	....	....	3	....	15	....	....	....	....	....	12	....	....	....	....	....	3	76	70
71	....	....	....	....	....	....	....	....	....	....	....	55	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	1	60	71
72	....	....	....	....	....	....	....	....	....	....	....	76	....	....	....	....	....	....	10	....	....	....	....	....	2	....	1	....	....	....	1	91	72
73	....	....	....	....	....	....	....	....	....	....	....	23	....	....	....	....	....	....	1	....	....	....	....	....	4	....	....	....	....	....	....	28	73
74	....	....	....	....	....	....	....	....	....	....	....	....	14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	74
75	....	....	....	....	....	....	....	....	....	....	....	....	....	53	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	53	75
76	1	....	....	1	1	....	....	....	....	....	2	....	....	113	2	....	13	....	....	....	1	1	3	....	....	....	4	....	....	....	3	157	76
77	1	1	....	3	....	1	....	....	....	....	5	....	....	54	....	....	7	....	....	....	1	....	....	....	....	....	3	....	....	....	....	87	77
78	....	....	....	....	....	....	....	....	....	....	....	....	....	50	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	60	78
79	2	....	....	....	1	....	....	....	....	....	3	....	....	259	....	....	6	....	....	....	....	....	....	....	....	1	8	....	....	....	1	284	79
80	....	....	....	....	....	....	....	....	....	....	....	....	....	19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	80
81	....	....	2	8	....	....	....	....	....	....	8	....	....	....	45	....	3	....	1	....	....	5	....	....	1	....	....	....	....	....	....	94	81
82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	68	....	....	....	....	....	....	....	....	....	8	....	....	....	....	....	79	82
83	....	....	....	1	....	....	....	....	8	....	1	....	....	2	....	....	68	1	....	....	....	1	....	....	2	1	....	....	....	....	6	93	83
84	....	4	5	2	3	5	....	3	58	....	26	36	....	18	....	3	332	6	11	....	....	....	2	4	6	6	8	2	....	3	22	648	84
85	1	1	....	....	....	....	....	1	29	....	9	1	....	2	....	....	271	....	....	....	1	....	2	....	1	1	1	2	....	....	11	350	85
86	1	....	....	....	....	....	....	....	4	....	5	1	....	....	....	....	64	....	....	....	1	....	....	1	1	1	....	....	....	3	13	101	86
87	2	1	2	5	....	5	....	....	15	....	11	20	....	2	....	1	140	....	1	....	2	....	....	1	2	5	2	4	1	2	13	266	87
88	1	1	....	....	....	....	....	1	7	....	17	2	....	4	....	....	35	1	1	....	....	1	....	1	....	1	1	1	....	....	....	11	93	88
89	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	120	....	....	....	....	....	....	....	....	....	1	....	....	....	....	124	89
90	....	....	....	....	....	....	....	....	....	....	....	3	....	1	....	....	....	....	95	....	....	....	....	....	1	....	....	....	....	....	....	104	90
91	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	....	....	....	....	....	1	....	....	....	....	....	14	91
92	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75	....	....	....	....	....	....	....	....	....	....	75	92
93	....	....	37	12	....	....	....	....	2	....	1	14	....	1	4	....	....	1	17	....	47	61	....	....	6	....	2	....	....	....	28	359	93
94	1	1	15	11	....	....	....	....	....	....	2	2	1	1	4	....	....	....	8	....	150	48	....	....	2	1	....	1	....	....	1	381	94
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	

Marginal Number.	NAME OF COLLEGE	1 Alabama.....380	2 Arizona.....16	3 Arkansas.....177	4 California.....396	5 Colorado.....87	6 Connecticut....180	7 Delaware.....22	8 Dist. of Col....101	9 Florida.....127	10 Georgia.....598	11 Idaho.....36	12 Illinois.....1,258	13 Indiana.....350	14 Iowa.....322	15 Kansas.....241	16 Kentucky.....200	17 Louisiana.....212	18 Maine.....114	19 Maryland.....253	20 Massachusetts..701	Marginal Number.
95	University of Tennessee, Coll. of Med., Memphis..	24	....	28	1	1	....	....	....	3	2	....	1	....	....	....	7	22	....	....	....	95
96	Univ. of W. Tenn., Coll. of Med. & Surg., Memphis	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	96
97	Texas Christian Univ., School of Med., Fort Worth	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	97
98	University of Texas, Dept. of Med., Galveston...	1	1	....	....	....	1	....	....	1	1	....	....	....	....	....	....	3	....	....	....	98
99	Baylor University, College of Medicine, Dallas....	1	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	....	....	....	99
100	Southern Methodist Univ., Med. Dept., Dallas....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	100
101	Univ. of Utah, School of Med., Salt Lake City...	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	101
102	Univ. of Vermont, College of Med., Burlington...	....	....	....	....	....	12	....	....	....	....	1	....	....	....	....	....	....	5	....	11	102
103	Medical College of Virginia, Richmond.....	....	....	....	2	....	3	....	....	1	1	....	1	....	....	....	....	1	....	2	....	103
104	Univ. of Virginia, Dept. of Med., Charlottesville...	2	....	2	....	....	....	1	1	1	3	1	....	1	....	....	....	....	....	3	....	104
105	West Virginia Univ., School of Med., Morgantown.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	105
106	Marquette Univ., School of Medicine, Milwaukee..	....	....	....	....	2	....	....	....	....	....	....	3	1	2	1	....	....	....	....	....	106
107	University of Wisconsin, Medical School, Madison.	....	....	....	....	....	....	....	....	....	....	....	7	1	1	1	....	....	....	....	....	107
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

* Information showing distribution not obtained. † Number of students, approximate. H.—Homeopathic. E.—Eclectic.

CONTINUED FROM PAGE 675

College	B.S. and M.D.	A.B. and M.D.
University of Alabama, School of Medicine	6	1
Leland Stanford Junior University, School of Med...	..	7
University of California, College of Medicine	7	7
College of Physicians and Surgeons, Los Angeles	..	6
College of Medical Evangelists, Loma Linda*	..	7
University of Colorado, School of Medicine	6	7
Yale Medical School, New Haven	..	6
George Washington University Medical School	6	7
Georgetown University, School of Medicine	6	..
University of Georgia, Medical Department	6	..
Bennett Medical College, Chicago	6	..
Chicago College of Medicine and Surgery, Chicago	6	..
Northwestern University Medical School, Chicago	6	..
Rush Medical College (University of Chicago)	6	7
University of Illinois, College of Medicine	6	..
Indiana University, School of Medicine	6	7
State University of Iowa, College of Medicine	6	7
State University of Iowa, College of Homeopathic Medicine, Iowa City—H	6	7
University of Kansas, School of Medicine	..	6
University of Louisville, Medical Dept., Louisville	6	..
Tulane University of Louisiana, School of Medicine	..	7
University of Maryland, School of Medicine	..	7
Boston University, School of Medicine—H	6	..
Tufts College Medical School, Boston	..	7
University of Michigan, Dept. of Med. and Surg	6	7
University of Michigan, Homeopathic Medical College	6	7
University of Minnesota, Medical School†	7	8
University of Mississippi, Department of Medicine	6	..
University of Missouri, School of Medicine	..	6 (4)
St. Louis University, School of Medicine	6	..
University of Nebraska, College of Medicine	6	7
Dartmouth Medical School, Hanover	6 (4)	7 (5)
Albany Medical College, Albany	..	7
Columbia University, College of Phys. and Surg	6	7
Cornell University Medical College, New York	..	7
Fordham University School of Medicine, New York	6	..
University and Bellevue Hospital Medical College	6	7
Syracuse University, College of Medicine, Syracuse	6	7
University of North Carolina, School of Medicine	6 (4)	..
Shaw University, Leonard Medical School	6 (4)	..
Wake Forest College, School of Medicine, Wake Forest	6 (4)	6 (4)
University of North Dakota, School of Medicine	..	6 (4)
Western Reserve University, School of Medicine	..	7
Medical College of the University of Cincinnati	6	7
Ohio State University College of Medicine	6	7
University of Oklahoma, School of Medicine	6	..
Temple University, Department of Medicine	..	7
University of Pennsylvania School of Medicine	..	7
University of Pittsburgh, School of Medicine	6	..
University of South Dakota, College of Medicine	..	6
University of Tennessee, College of Medicine	7	7
University of Texas, Department of Medicine	6	7
University of Utah, School of Medicine	6 (4)	..
University of Virginia, Department of Medicine	6	..
Marquette University, School of Medicine	6	..
University of Wisconsin, Medical School	6 (4)	7 (5)

* This college requires a five-year course in medicine and theology, and the combined arts-medical-theological course is seven years.

† Two years in college and five years in medicine are required for the B.S. and M.D. degrees, three years in college and five years in medicine for the A.B. and M.D. degrees. The five-year medical course includes the hospital intern year.

The Association of American Medical Colleges

The requirements for admission to and graduation from colleges holding membership in this association are as follows:

SECTION 1.—Every college holding membership in this Association shall, on and after Jan. 1, 1912, require for matriculation a completed or unconditioned medical student's certificate, to be granted by a state medical examining and licensing board, or a board empowered by statute to grant such certificates, or a certificate of entrance to the academic department of any state university, or a certificate of entrance to an accredited university or college, providing that said certificate is granted on no less than the following requirements:

(*a*) A bachelor's degree from an accredited college or university.

(*b*) A diploma and transcript of record from a fully accredited high school, normal school or academy requiring for admission evidence of the completion of a standard course in primary and intermediate grades, and for graduation, the completion of a standard four-year high-school course, embracing two years (2 units) of mathematics, two years (2 units) of English, two years (2 units) of one foreign language, one year (1 unit) of American history and civics, and seven years (7 units) of further credit in language, literature, history or science, making the total of units at least fourteen; and in addition, one year each of physics, chemistry and biology of college grade of each not less than eight semester hours.

(*c*) An examination in the following branches totaling 14 units:

(A) Required, 7 units.

	Units
Mathematics (minimum 2 years, maximum 3 years), algebra and plane geometry	2
English (minimum 2 years, maximum 4 years)	2
One foreign language (minimum 2 years, maximum 4 years	2
History (U. S.) and civics	1
Total number of required units	7

(B) Elective, 7 units.
To be selected from the following:

	Units
English language and literature (in addition to the required work)	1 to 2
Foreign languages, additional, Latin, German, Italian, French, Spanish or Greek (not less than 1 year in any one)	1 to 4
Advanced mathematics, advanced algebra, solid geometry and trigonometry (½ year each)	1
Natural science, chemistry 1 year, physics 1 year, and biology, botany, physiology and zoology (½ to 1 year each)	½ to 2
Earth science, physical geography, geology and agriculture (½ year to 1 year each)	½ to 1
Astronomy (½ year)	½
Drawing (½ to 1 year)	½ to 1
History, ancient, medieval and modern, and English (1 year each)	1 to 3
Economics (½ year)	½
Manual training (1 year)	1
Book-keeping (½ to 1 year)	½ to 1

And in addition one year each of physics, chemistry and biology of college grade, of each not less than 8 semester hours.

One unit in any subject is the equivalent of work in that subject for four or five periods per week for a year of at least thirty-six weeks, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

THE PRELIMINARY COLLEGE YEAR

(*a*) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(*b*) In excellence of teaching and in content, the work of this preliminary college year shall be equal to the work done in the freshmen year in standard colleges and universities.

(*c*) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the following schedule, provided that a student may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues and does not duplicate the work done in the high school; provided also, that a student may satisfy the requirement of French or German by presenting two units of regular high-school work in either language and completing a half year of college work in that language, which con-

Marginal Number.	21 Michigan.....479	22 Minnesota.....302	23 Mississippi.....279	24 Missouri.....528	25 Montana.....30	26 Nebraska.....377	27 Nevada.....3	28 New Hampshire..42	29 New Jersey.....352	30 New Mexico.....7	31 New York....2,100	32 North Carolina.475	33 North Dakota...62	34 Ohio.....701	35 Oklahoma.....128	36 Oregon.....103	37 Pennsylvania.1,941	38 Rhode Island....76	39 South Carolina.371	40 South Dakota...50	41 Tennessee.....409	42 Texas.....573	43 Utah.....55	44 Vermont.....82	45 Virginia.....427	46 Washington.....58	47 West Virginia...202	48 Wisconsin.....269	49 Wyoming.....11	50 Philippines, etc.126	51 Foreign.....555	52 Totals.....10,502	Marginal Number
95	....	....	83	3	....	....	....	....	....	1	.....	2	....	1	5	....	....	....	1	....	101	32	....	....	1	1	....	1	....	....	....	321	95
96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	73	....	....	....	....	....	....	....	....	....	....	73	96
97	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46	....	....	....	....	....	....	....	....	....	48	97
98	....	....	1	....	....	....	....	....	....	1	.....	1	....	....	....	....	....	....	....	....	....	161	....	....	....	....	....	....	....	....	....	172	98
99	....	....	1	....	....	....	....	....	....	....	.....	1	....	....	2	1	....	....	....	....	1	39	....	....	....	....	1	....	....	....	....	50	99
100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	48	....	....	....	....	....	....	....	....	....	51	100
101	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	....	....	....	....	....	1	....	....	20	101
102	....	....	....	....	....	....	....	6	4	....	18	....	....	1	....	....	1	3	....	....	....	1	....	.50	2	....	....	1	1	....	....	117	102
103	....	....	....	....	....	....	....	....	2	....	9	81	....	4	....	....	....	....	9	....	1	....	....	....	235	....	22	....	....	....	12	386	103
104	....	....	8	....	....	....	....	....	2	....	1	10	....	....	1	....	2	....	5	....	3	....	....	....	48	....	5	1	....	....	3	104	104
105	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	21	....	....	....	....	21	105
106	6	19	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	129	....	3	1	169	106
107	....	3	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	2	1	....	....	....	....	....	63	....	1	2	83	107
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	

tinues and does not duplicate the work done in the high school, or by presenting three units of regular high-school work in French or German.

In the administration of the entrance requirements of the preliminary college year by the members of this Association conditions may be allowed until September, 1917, amounting to not more than one-half of the requirement in physics and one-half of the requirement in a modern language.

All such conditions shall be removed before registration for the second year.

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods* Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1..	2	2	4	8
Chemistry, 1	2	2	4	8
Biology, 1..	2 or 3	2 or 1	4	8
German or French, 2	4 or 3	.....	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS:

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1....	64	128	192
Chemistry, 1.	64	128	192
Biology, 1...	64 or 96	128 or 64	192 or 160
German or French, 2..	128 or 96	.....	128 or 96
Totals	320	384 or 320	704 or 640

(*d*) In medical colleges planning to give the work of the preliminary year, provision should be made for full-time expert teachers in the various subjects. Sufficient equipment should be provided to enable the students to do the work intelligently—in amount such as will compare favorably with the equipment for these courses in standard colleges and universities.

(*e*) It should be remembered that the chief object of the work of the preliminary college year is to provide the student with a training that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

Sec. 2.—The examination of credentials must be conducted by and under the authority of the board of medical examiners of the state in which the college is located, or by a duly authorized examiner of the college entrance examination board, or the authorized examiner of an accredited university, state or otherwise, or by an examiner whose certificates are accepted by accredited colleges or universities, or by a method approved by the judicial council of this association.

Sec. 3.—The term "accredited" as applied to high schools, academies, colleges and universities means institutions of that type that have been investigated and are accredited by the state university of their respective states, by the North Central Association of Colleges and Secondary Schools, the Association of Colleges and Preparatory Schools of the Southern States, the Association of Colleges and Preparatory Schools of the Middle States and Maryland, the New England College Entrance Certificate Board, the Association of American Universities and the Association of State Universities, provided that such accrediting is based on Article III, Section 1, of this constitution.

Sec. 4.—Colleges in membership in this Association may honor the official credentials presented by students from other colleges having the standard requirements maintained by members of this Association, excepting for the fourth year of the course, but no member of this Association shall admit a student to advanced standard without receiving from the dean, secretary or registrar of such college a direct written communication certifying to the applicant's standing. Credit for time or scholarship cannot be given beyond that of the college issuing the credentials, except by mutual agreement between the colleges.

Sec. 5.—Candidates for the degree of Doctor of Medicine shall have attended four courses of study in four calendar years, each annual course to have been of not less than thirty-two teaching weeks' duration, and at least ten months shall intervene between the beginning of any course and the beginning of the preceding course.

Sec. 6.—No time credit shall be given to holders of a Bachelor's degree, but subject credit may be given on satisfactory examination. Four years of residence in a medical college shall be required of all candidates for the degree of Doctor of Medicine.

Sec. 7.—A college which gives less than a four years' course of study, but does not graduate students, and is possessed of other required qualifications, may be admitted to membership.

Sec. 8.—Each student shall be obliged to attend not less than 80 per cent. of the exercises in every annual course of study for which he seeks credit. No student shall be given credit on examination unless he attains a grade of at least 70 per cent. or its equivalent in any other marking system. And no student shall be graduated unless he shall have attained a passing grade in each and all subjects of the required curriculum.

CURRICULUM

Section 1.—The entire course of four years shall consist of at least 4,000 hours for each student, and shall be grouped in divisions and subdivided into subjects; each division and subject to be allotted the number of hours as shown in the following schedule:

DIVISION 1.—ANATOMY, 720 HOURS (18 PER CENT.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Gross anatomy (including applied anatomy)	510	120	390
(b) Histologic and microscopic anatomy	135	30	105
(c) Embryology	75	30	45

DIVISION 2.—PHYSIOLOGY AND CHEMISTRY, 600 HOURS (15 PER CENT.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Inorganic chemistry	180	60	120
(b) Organic chemistry	75	30	45
(c) Physiologic chemistry	104	30	75
(d) Physiology	240	140	100

DIVISION 3.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 HOURS (11.25 PER CENT.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Bacteriology	135	30	105
(b) Hygiene and general dietetics	45	45	...
(c) Pathology	270	60	210

DIVISION 4.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 HOURS (6 PER CENT.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Pharmacology	105	40	65
(b) Materia medica and pharmacology	80	...	...
(c) Therapeutics	55	...	...

DIVISION 5.—MEDICINE AND MEDICAL SPECIALTIES, 970 HOURS (24.25 PER CENT.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) General medicine (including clinical microscopy)	640	...	...
(b) Pediatrics	150	...	...
(c) Nervous and mental diseases	105	...	...
(d) Jurisprudence, ethics and economics	30	...	...
(e) Dermatology and syphilis ...	45	...	...

Name of College	Enrolled During 1913-14				
	1st Yr.	2d Yr.	3d Yr.	4th Yr.	Total
Birmingham Medical College	.....	.....	23	34	57
Univ. of Alabama School of Med.	33	28	13	15	94
Univ. of Ark. Med. Dept., Little Rock	18	15	21	41	95
College of P. and S., San Francisco	9	4	7	14	34
Hahnemann Med. Coll. of Pacific.—H.	16	8	5	11	40
Leland Stanford Jr. Univ. Sch. of Med.	27	18	16	14	75
University of California Coll. of Med.	45	45	19	15	124
Cal. Eclec. Med. Coll., Los Angeles.—E*	9	2	2	25	38
College of P. and S., Los Angeles	64	23	30	36	153
Oakland Coll. of M. and S., Oakland	5	3	4	3	15
Coll. of Med. Evangelists, Loma Linda	24	14	14	23	75
Univ. of Colorado School of Medicine	13	18	7	16	54
Yale Medical School, New Haven	23	11	7	8	49
George Washington Univ. Med. School	76	48	27	20	171
Georgetown Univ. School of Medicine	11	16	40	32	99
Howard University School of Medicine	21	24	31	34	110
Atlanta Medical College, Atlanta	77	134	139	138	488
Georgia Coll. of Eclec. Med. and Surg.	2	19	9	21	51
Southern Coll. of M. and S., Atlanta	4	8	14	23	49
University of Georgia, Med. Dept.	24	6	8	20	58
Bennett Medical College, Chicago	93	118	84	111	406
Chicago College of Med. and Surgery	164	165	115	194	638
Chicago Hospital College of Medicine	.....	.....	.....	.....	75
Hahnemann Med. Coll. and Hosp.—H.	32	22	21	17	92
Jenner Medical College, Chicago	98	53	30	18	199
Northwestern Univ. Med. Sch., Chicago	38	34	38	70	180
Rush Medical College, Chicago †	131	131	106	94	462
University of Illinois Coll. of Med.	62	138	106	116	422
Indiana University School of Medicine	45	37	27	24	133
State University of Iowa College of Medicine, Iowa City	34	35	26	13	108
State University of Iowa College of Homeo. Med., Iowa City.—H.	3	.....	2	.....	5
University of Kansas School of Med.	50	29	15	11	105
University of Louisville Med. Dept.	96	60	67	55	278
Tulane Univ. of La. School of Medicine	70	76	88	93	327
Medical School of Maine, Portland	13	10	24	20	67
College of P. and S., Baltimore	31	34	58	61	184
Johns Hopkins University Med. Dept.	89	88	91	92	360
Univ. of Maryland School of Medicine	98	106	133	117	454
Boston Univ. School of Med.—H.	48	21	22	22	113
College of P. and S., Boston *	38	16	30	26	110
Medical School of Harvard University	68	67	94	76	305
Tufts College Medical School, Boston	111	72	53	75	311
Detroit College of Med. and Surg.	92	60	42	55	249
University of Michigan Department of Med. and Surg., Ann Arbor	106	85	52	39	282
Univ. of Mich. Homeo. Med. College	18	12	18	25	73
Univ. of Minnesota Medical School	65	36	37	31	169
Univ. of Mississippi Dept. of Med.	18	17	.....	.....	35
Univ. of Missouri School of Medicine	33	22	.....	.....	55
Kansas City Hahn. Med. Coll.—H*	13	9	11	13	46
Eclectic Med. Univ., Kansas City	23	16	12	14	65
Ensworth Medical College, St. Joseph	.....	.....	.....	10	10
American Medical College, St. Louis	36	38	38	34	146
St. Louis Univ. School of Medicine	60	49	48	47	204
St. Louis College of P. and S.	8	3	13	24	48
Washington Univ. Med. Sch., St. Louis	15	3	28	15	61
John A. Creighton Medical College	49	51	47	25	182
Univ. of Nebraska Coll. of Med.	28	30	13	13	84
Cotner University Medical College.—E.	5	11	8	5	29
Dartmouth Medical School, Hanover	10	7	.....	6	23
Albany Medical College, Albany	83	67	53	55	258
Columbia Univ. College of P. and S.	89	60	88	71	308
Cornell Univ. Med. Coll., New York City	36	32	20	20	108
Fordham Univ. School of Medicine	62	46	38	29	175
Long Island Coll. Hosp., New York City	97	95	79	89	360
New York Homeopathic Medical College and Flower Hospital.—H.	47	66	70	54	237
New York Medical College and Hospital for Women.—H.	14	12	9	7	42
University and Bellevue Hospital Medical College, New York	101	44	102	86	333
Syracuse University College of Med.	34	32	13	17	96
Univ. of Buffalo Med. Dept., Buffalo	90	44	55	47	236
Leonard Medical School, Raleigh	12	12	26	26	76
Univ. of North Carolina, School of Med.	38	22	.....	.....	60
North Carolina Med. Coll., Charlotte	28	13	22	28	91
Wake Forest School of Medicine	17	11	.....	.....	28
Univ. of North Dakota School of Med.	9	5	.....	.....	14
Cleveland-Pulte Medical College	10	13	19	11	53
Western Reserve University School of Medicine, Cleveland	35	48	40	34	157
Eclectic Med. Coll., Cincinnati.—E.	24	21	21	21	87
University of Cincinnati Medical College	19	12	15	14	60
Ohio State University Coll. of Med.	114	69	43	58	284
Toledo Medical College, Toledo	3	3	6	7	19
Univ. of Oklahoma School of Med.	44	18	17	15	94
Univ. of Oregon Dept. of Med., Portland	14	19	20	26	79
Hahnemann Med. Coll. and Hosp., Phila.	37	21	21	14	93
Jefferson Medical College, Philadelphia	134	193	154	167	648
Medico-Chirurgical Coll. of Philadelphia	101	77	85	87	350
Temple Univ. Dept. of Med., Philadelphia	19	20	29	33	101
Univ. of Pennsylvania School of Med.	65	68	57	76	266
Woman's Med. College of Pennsylvania	26	17	31	19	93
University of Pittsburgh, School of Med.	38	27	14	45	124
Medical Coll. of the State of S. Carolina	29	22	28	25	104
Univ. of South Dakota College of Med.	5	9	.....	.....	14
Lincoln Memorial University Med. Dept.	13	29	19	14	75
Meharry Medical College, Nashville	114	80	84	81	359
Vanderbilt Univ. Med. Dept., Nashville	134	74	105	68	381
University of Tennessee College of Med.	72	84	82	83	321
Univ. of West Tenn. Coll. of M. and S.	8	10	26	29	73
Texas Christian Univ. School of Med.	18	5	13	12	48
Univ. of Texas Dept. of Med., Galveston	86	36	27	23	172
Baylor University Coll. of Med., Dallas	3	11	15	21	50
Southern Methodist Univ. Med. Dept.	5	15	13	18	51
University of Utah School of Medicine	12	8	.....	.....	20
University of Vermont College of Med.	18	14	41	44	117
Medical College of Virginia, Richmond	105	88	97	96	386
University of Virginia Dept. of Med.	38	23	24	19	104
West Virginia University School of Med.	13	8	.....	.....	21
Marquette University School of Med.	13	51	53	52	169
University of Wisconsin Medical School	61	22	.....	.....	83
Totals	4084	3981	3807	3955	16502

* Figures are approximate. † There were 262 students in the first two years.

Note.—This table gives for each college, from which the information was obtainable, the number of students enrolled in each of the four classes. Some colleges do not publish classified lists of their students. Nine colleges teach only the work of the first two years. Birmingham Medical College taught only juniors and seniors and the Ensworth Medical College of St. Joseph, Mo., taught only seniors.

This table is very interesting in the light of the rapid trend toward higher entrance requirements and should be studied in connection with the lists of colleges given on pages 671 and 675. Some of the colleges holding to higher standards show an increase in their first year enrollments, thereby recovering from the reductions which immediately followed the adoption of the higher standards. Such increases are shown for Yale Medical School, Rush Medical College, University of Kansas School of Medicine, University of Michigan Department of Medicine and Surgery and the University of Minnesota Medical School.

In numerous instances a larger freshman class shows a college which has continued to hold to a high school education or lower standards for entrance while the majority of medical colleges have voluntarily raised their requirements for admission to one or two years of collegiate work. Among such colleges which have increased freshman classes are: College of Physicians and Surgeons, Los Angeles; George Washington University Medical School; Jenner Medical College; University of Louisville Medical Department; Tufts College Medical School; University of Buffalo Medical Department; Ohio State University College of Medicine; Medico-Chirurgical College, Philadelphia; Vanderbilt University Medical Department and the Medical College of Virginia. Smaller freshman classes will be the rule for these colleges next session, however, since practically all of them hereafter require at least one year of collegiate work for admission in addition to a high school education.

The actual enforcement of higher preliminary standards always results in a decreased enrollment. Atlanta Medical College vigorously enforced a high school educational requirement and reduced its entering class by almost half. That the University of Illinois College of Medicine and Marquette University School of Medicine enforced for the first time the preliminary requirement of one year of collegiate work is evidenced by the smaller freshman classes enrolled.

The six colleges having the largest enrollments are Jefferson Medical College, 648; Chicago College of Medicine and Surgery, 638; Atlanta Medical College, 488; Rush Medical College, 462; University of Maryland School of Medicine, 454, and the University of Illinois College of Medicine, 422. There are twenty-eight medical colleges each of which has over 200 students enrolled.

DIVISION 6.—SURGERY AND SURGICAL SPECIALTIES, 720 Hours (18 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) General surgery	510		...		...	
(b) Orthopedic surgery	45		...		...	
(c) Genito-urinary diseases	45		...		...	
(d) Eye	60		...		...	
(e) Ear, nose and throat	60		...		...	

DIVISION 7.—OBSTETRICS AND GYNECOLOGY, 300 Hours (7.5 Per Cent.)

	Hours.	Lect.	Rec.	Dem.	Lab.	Wk.
(a) Obstetrics	195		...		...	
(b) Gynecology (including some abdominal surgery)	105		...		.	

Colleges may reduce the number of hours in any subject not more than 20 per cent. provided that the total number of hours in a division is not reduced. Where the teaching conditions in a college are best subserved, the subject may be, for teaching purposes, transferred from one division to another. When didactic and laboratory hours are specified in any subject, laboratory hours may be substituted for didactic hours.

SEC. 2.—Each medical college in membership in the Association shall print in every annual catalogue or announcement a table of the total number of hours work given in said college, arranged both by subjects and years.

SEC. 3.—Each college in membership in this Association shall print annually a list of its students by classes.

MEMBERS OF ASSOCIATION

University of Alabama School of Medicine.
Leland Stanford Junior University School of Medicine.
University of California College of Medicine.
College of Physicians and Surgeons, Los Angeles.
University of Colorado School of Medicine.
Yale Medical School.
Georgetown University School of Medicine.
George Washington University Medical School.
Howard University School of Medicine.
University of Georgia Medical Department.
Northwestern University Medical School.
Rush Medical College.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa College of Medicine.
University of Kansas School of Medicine.
University of Louisville Medical Department.
Tulane University of Louisiana School of Medicine.
College of Physicians and Surgeons, Baltimore.
Johns Hopkins University Medical Department.
University of Maryland School of Medicine.
Medical School of Harvard University.
Tufts College Medical School.
Detroit College of Medicine and Surgery.
University of Michigan Department of Medicine and Surgery.
University of Minnesota Medical School.
University of Mississippi Department of Medicine.
St. Louis University School of Medicine.
University of Missouri School of Medicine.
Washington University Medical School.
John A. Creighton Medical College.
University of Nebraska College of Medicine.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Syracuse University College of Medicine.
University and Bellevue Hospital Medical College.
University of Buffalo Medical Department.
University of North Carolina School of Medicine.
Wake Forest College School of Medicine.
University of North Dakota School of Medicine.
Medical College of the University of Cincinnati.
Ohio State University College of Medicine.
Western Reserve University School of Medicine.
University of Oklahoma School of Medicine.
Hahnemann Medical College and Hospital, Philadelphia.
University of Pennsylvania School of Medicine.
University of Pittsburgh School of Medicine.
University of the Philippines College of Medicine and Surgery.
Meharry Medical College.
Vanderbilt University Department of Medicine.
University of Texas Medical Department.
University of Utah School of Medicine.
University of Vermont College of Medicine.
Medical College of Virginia.
University of Wisconsin Medical School.

The secretary-treasurer of the Association is Dr. Fred. C. Zapffe, 3431 Lexington Street, Chicago.

COLLEGE NOTES

Colleges Closed During the Year.—Six medical colleges have been reported as closed during the year, of which two were closed by merger into other colleges. The colleges are:

Georgia College of Eclectic Medicine and Surgery, Atlanta.

Southern College of Medicine and Surgery, Atlanta, Ga. This college was closed, it is reported, following withdrawal of recognition by the Georgia State Board of Medical Examiners.

Ensworth Medical College, St. Joseph, Mo. This college graduated its last class and voluntarily closed.

North Carolina Medical College, Charlotte, N. C. This college was merged with the Medical College of Virginia at Richmond.

Toledo Medical College, Medical Department of the Toledo University. Reported closed following withdrawal of recognition by the Ohio State Medical Board.

Lincoln Memorial University, Medical Deartment, Knoxville, Tenn. Merged with the University of Tennessee, College of Medicine at Memphis.

Special Items Concerning Medical Education

Alabama.—The University of Alabama School of Medicine will require two years of collegiate work for admission beginning with the session of 1915-16.

——The Alabama State Board of Medical Examiners has adopted two years of collegiate work as the minimum standard of preliminary education which will apply to all candidates matriculating in the session of 1915-16 and thereafter who desire to secure licenses to practice medicine in Alabama. It affects all graduates of 1919 and thereafter.

California.—The Leland Stanford Junior University, School of Medicine, received a gift of $10,000 by the will of Charles G. Latrop.

——A sum of $615,750 was obtained from various donors by the University of California Medical Department and used for building a new teaching hospital.

Colorado.—The faculty of the University of Colorado, School of Medicine, has undergone a complete reorganization. In place of the medical senate there is now an executive committee of five members, including the dean as chairman. Three standing committees on curriculum, hospitals and dispensary have been appointed, the chairman of each being a member of the executive committee.

Connecticut.—Yale Medical School has received $500,000 from the General Education Board (the Rockefeller Foundation), on condition that the school procure complete control of the New Haven General Hospital and that the professors in the main clinical branches be placed on the full-time or university basis.

——Yale Medical School has also received a gift of $400,000 by the will of the late Mrs. George Lauder to establish a chair of public health.

Georgia.—The Georgia legislature appropriated $30,000 for the Medical Department of the University of Georgia for maintenance for two years.

Illinois.—Beginning with the session of 1914-15 all matriculants in medical colleges who expect to secure licenses in Illinois must have completed at least one year in a college of liberal arts before entering on the study of medicine or have its full equivalent in a medical school giving the five-year course.

——The alumni of Rush Medical College have raised $10,000 toward a sum of $30,000 to be added to the endowment fund of their Alma Mater. This college has limited its enrolment to 100 students in each of the first and second years and 120 students in each of the third and fourth years.

——A sum of $1,000,000 has been donated by Mr. James Deering to Wesley Hospital of Chicago to be used as an endowment fund for charity beds. It is provided that Wesley Hospital be a teaching hospital with a staff made up from the faculty of the Northwestern University Medical School.

Indiana.—The Robert W. Long State Hospital at Indianapolis, the teaching hospital of the University of Indiana School of Medicine, has been completed at a total cost of $225,000, which was the gift of Dr. and Mrs. Robert W. Long. The University of Indiana has also received a gift of 160 acres of Texas land, the proceeds from the sale of which will go toward the maintenance of the Long Hospital.

Maryland.—The General Education Board (the Rockefeller Foundation) has given to the Medical Department of Johns Hopkins University a gift of $1,500,000 in order that the professors of the three main clinical departments might be placed on a full-time or academic basis. Another gift of $50,000 from the same source was obtained, to be used in the developing of the Hunterian laboratories.

——Another gift of $250,000 was received by Johns Hopkins University, Medical Department, from James Buchanan Brady for a urological clinic which will be known as the Brady Urological Clinic. Mr. Brady's gift also provides for $15,000 annually for maintenance.

——The Johns Hopkins University, Medical Department, has limited its enrolment to 90 students in each class.

——The endowment funds being raised for the University of Maryland School of Medicine, by its alumni, amounted in the last report to $31,633, of which about one-third is for the pathological endowment fund and two-thirds for the faculty of physic fund. The university is making an effort also to secure some endowed scholarships.

Massachusetts.—Harvard University is to receive "a greater part" of an estate of $500,000—exact amount not stated—to be used for medical research.

——The Peter Bent Brigham Hospital at Boston has been completed at a cost, including the land and the erection of the buildings, of $1,350,000. The grounds immediately adjoin the campus of the Medical School of Harvard University. This hospital has remaining a fund of $4,500,000 to provide an income for maintenance.

Michigan.—Detroit College of Medicine and Surgery is reported to have raised $100,000 toward a $1,000,000 endowment fund.

Minnesota.—The University of Minnesota Medical School has established teaching fellowships in the clinical departments, with a view of providing well-trained, full-time assistants and research workers and at the same time give a basis for graduate instruction in the specialties. The fellowships are in three grades: first year, $500; second year, $750, and third year, $1,000.

——The University of Minnesota, Medical School, has provided a graduate course of two years for the training of specialists in ophthalmology, and opportunity will be provided so that courses in otology, laryngology and rhinology may be taken at the same time. A suitable degree will be granted at the end of the course.

Missouri.—Washington University Medical School received a gift of $150,000 by the will of Adolphus Busch. From the General Education Board $750,000 was received on condition that, from other sources, the sum be increased to $1,500,000, and that it be used to place the professors of the main clinical chairs on a full-time or academic basis.

——The new group of buildings for the Washington University Medical School, the Barnes Hospital and the St. Louis Children's Hospital have been completed on the new campus at Kingshighway and Euclid Avenue, St. Louis. The total cost exceeds $1,000,000. There is also a fund of $2,000,000, the income from which provides for the maintenance of the Barnes Hospital.

Nebraska.—The University of Nebraska, College of Medicine, has moved into its new building on the Omaha campus, and now all four years of the medical course are given in Omaha. The new building was erected at a cost of $115,000.

New York.—A closer affiliation has been established between the Columbia University, College of Physicians and Surgeons and the Presbyterian Hospital which gives to the former larger teaching privileges.

——Columbia University received $200,000 from the family of the late W. Bayard Cutting for traveling fellowships open to graduates of the university, including the medical school. Other gifts were $2,500 for surgical research and $1,000 for salaries in the department of physiology.

——The Long Island College Hospital received $20,000 by the will of Mrs. Matilda E. Webb.

——Under the will of the late Dr. Roswell Park, his entire library consisting of about three thousand volumes was given to the University of Buffalo, Medical Department.

——The New York Homeopathic Medical College and Flower Hospital has received a donation of $25,000 for research work in cancer.

——The University and Bellevue Hospital Medical College received a gift of $10,000 by the will of the late Dr. Joseph D. Bryant to provide for a more thorough teaching of medical ethics.

——Albany Medical College received a gift of $5,000 by the will of Sylvester McDonald. Another gift of $10,000 was received by the will of Dr. John M. Bigelow.

——Cornell University, Medical College, received as an endowment $4,000,000 from (it is believed) Col. Oliver Hazard Paine of New York City. This is perhaps the largest individual gift ever made to a medical school. The gift provides an annual income of about $200,000.

——The endowment of the Rockefeller Institute for Medical Research has been increased by its founder by $2,500,000. An additional $1,000,000 was given to establish a department of animal pathology. The total gifts by Mr. Rockefeller to the institute now amounts to $12,500,000. Mr. James J. Hill gave $50,000 to the new department of animal pathology to use in the study of hog cholera. Dr. Theobald Smith, formerly professor of comparative pathology at the Medical School of Harvard University, has been made director of this new department.

Ohio.—The Medical College of the University of Cincinnati has received from the will of Mrs. Francis W. Gibson the sum of $31,400 to go toward the endowment fund. A gift of $25,000 was received by the will of Mrs. Jeanette Moss to endow the chair of medicine.

Oregon.—A site for the University of Oregon, Department of Medicine, valued at $100,000 has been donated by the Oregon-Washington Railroad and Navigation Company, with the stipulation that the site be occupied by a hospital or by institutions for the furtherance of scientific research and teaching.

Pennsylvania.—The Woman's Medical College of Pennsylvania has received $22,500 toward a $500,000 endowment fund. An appropriation of $10,000 was made by the Pennsylvania legislature for the Hospital of the Woman's Medical College of Pennsylvania.

——Jefferson Medical College has purchased for $12,000 a three-story brick building adjoining the Baugh (Jefferson College) Institute of Anatomy.

——The University of Pennsylvania School of Medicine has received gifts as follows: $15,000 to endow three beds in the children's orthopedic ward of the University Hospital; a residuary fund of $1,500,000 for the University library, the University Hospital, and the departments of dermatology, archeology and paleontology. The faculty has voted to admit women students beginning this fall.

——The University of Pittsburgh School of Medicine has received as a gift the library of the late Prof. Ernest Zeisler, for many years professor of pathology at the University of Freiburg, which was purchased for the University by Mr. Richard Beatty Mellen. In addition to the above Mr. Mellen has endowed a fellowship in internal medicine and also provided funds to install and maintain an electrocardiographic apparatus.

——A scholarship amounting to $12,000 for the benefit of women students has been provided at the University of Pittsburgh School of Medicine by a congress of the women's clubs of western Pennsylvania.

Tennessee.—Vanderbilt University, Medical Department, has been made secure in its rights to use the $1,000,000 given last year by Mr. Andrew Carnegie. This was brought about by the supreme court decision that the Board of Trustees of Vanderbilt University and not the General Conference of the Methodist Episcopal Church had the right to fill vacancies on that board.

Total Gifts During the Year.—During the last twelve months, so far as reports indicate, the total gifts for new laboratories and medical-school buildings was approximately, $567,500; for endowments and maintenance, $8,163,500; for research and public health instruction in medical schools, $675,000, a total of $9,406,000. If to this is added the $4,010,750 given to build and maintain teaching hospitals and the $3,550,000 given for medical research at the Rockefeller Institute, the grand total of donations for medical education, teaching hospital and research during the year would be $16,966,750. This does not include the regular incomes of the medical schools for maintenance coming through the regular university channels.

Another School of Public Health

The University of Minnesota inaugurates, with the fall session, a school of public health to be administered by the medical school, through a committee in direct charge. The ranking member of its faculty will sit in the administrative board of the medical school.

It will begin with the offer of courses for medical health officers. These courses have been laid out for the ensuing year. The doctorate in medicine will be a preliminary requirement. The first year's work may, however, be taken by post seniors of the medical school in lieu of the required year of hospital internship. A certificate of proficiency in sanitary science will be given on the satisfactory completion of the first year's work. This will be followed, however, by advanced courses, for a second year, leading to a degree, probably, in public health.

The first year's curriculum will call for a total of 1,000 hours, of which 500 will be devoted to required work and 500 to elective work.

The required courses will deal with public health laws; public health organization and administration; the theory and practice of statistics; personal hygiene; school hygiene; infant mortality; the sanitation of travel; industrial hygiene; communicable diseases; sex hygiene and venereal diseases; the hygiene of milk; of water supplies and of food; sewerage; refuse collection and disposal; the sanitation of buildings; town planning; housing; labor problems; economic conditions in American cities; school supervision; general physiography; elements of psychology; municipal administration, and hospital administration.

Among the electives provided are courses in epidemiology, public health laboratories, Pasteur institute, sanitary engineering, water and sewage laboratory methods, school hygiene, vital statistics, physical and human geography, protozoology, algae, meteorology, construction and interpretation of geologic maps, infant mortality, mental retardation, experimental psychology, dairy chemistry, study of meats, and animal parasites and parasitic diseases.

The school of public health will also plan and conduct courses in sanitary and hygienic subjects in other departments of university instruction.

It will have general oversight of the health interests of the university communities and will frame sanitary regulations for the benefit of students and faculties.

MEDICAL EDUCATION IN THE UNITED STATES

The tabulated statistics herewith presented (page 657) are for the year ending June 30, 1914, and are based on reports received from the medical colleges or from other reliable sources. We take pleasure in acknowledging here the courtesy and cooperation of the various officials who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1 (pages 674-676) gives the colleges in session during 1913-1914; the population of the city; the rating given to the college in the third classification of the Council on Medical Education; the number of students, men and women, registered during the year; the number of 1914 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 657 are given essential facts concerning all medical colleges arranged by states.

NUMBER OF MEDICAL STUDENTS

The total number of medical students (matriculants) in the United States for the year ending June 30, 1914, excluding premedical, special and postgraduate students, was 16,502, a decrease of 513 below last year, a decrease of 1,910 below 1912 and a decrease of 11,640 below 1904, when 28,142, the highest number of students, were enrolled. Of the total number

TABLE 4.—MEDICAL COLLEGE ATTENDANCE

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Nondescript.	Total.
1880.....	9,776	1,220	830	...	...	11,826
1890.....	13,521	1,164	719	...	...	15,404
1900.....	22,710	1,900	522	...	...	25,171
1901.....	23,846	1,683	664	80	144	26,417
1902.....	24,878	1,617	765	91	150	27,501
1903.....	24,930	1,498	848	149	190	27,615
1904.....	23,602	1,309	1,014	123	234	28,142
1905.....	24,119	1,104	578	114	232	26,147
1906.....	23,116	1,085	644	110	249	25,204
1907.....	22,302	1,039	545	97	292	24,276
1908.....	20,936	891	479	90	206	22,602
1909.....	20,554	809	413	52	227	22,145
1910.....	20,136	867	455	49	19	21,526
1911.....	18,414	800	433	49	...	19,786
1912.....	17,277	827	308	...	...	18,412
1913.....	15,919	850	256	...	...	17,015
1914.....	15,438	794	270	...	...	16,502

of students, 15,438 were in attendance at the non-sectarian (regular) colleges, 794 at the homeopathic and 270 at the eclectic colleges. The attendance at the non-sectarian colleges shows a decrease of 481 below that of last year, a decrease of 1,839 below 1912 and a decrease of 9,492 (38 per cent.) below 1903, when 24,930, the largest number of non-sectarian students, were enrolled. In the homeopathic colleges there was a decrease of 55 below the attendance of last year, a decrease of 31 below 1912 and a decrease of 1,105 (58 per cent.) below 1900, when 1,909, the largest number of homeopathic students, were enrolled. The eclectic colleges show an increase of 14 over the registration of last year but a decrease of 38 below 1912 and a decrease of 744 (73 per cent.) below 1904, when the largest number of eclectic students were enrolled.

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1914, was 3,594, a decrease of 387 below 1913, and a decrease of 889 below 1912. The total this year is 2,153 (37.5 per cent.) less than in 1904, when 5,747, the largest number, were graduated. The

TABLE 5.—MEDICAL COLLEGE GRADUATES

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Nondescript.	Total.
1880.....	2,672	280	188	..	..	3,241
1890.....	3,853	380	221	..	..	4,454
1900.....	4,715	413	86	..	..	5,214
1901.....	4,879	387	148	18	12	5,444
1902.....	4,508	336	128	16	11	5,009
1903.....	5,088	420	149	24	17	5,698
1904.....	5,190	371	146	20	20	5,747
1905.....	5,126	276	153	22	23	5,600
1906.....	4,841	286	186	22	29	5,364
1907.....	4,591	225	121	11	22	4,980
1908.....	4,370	215	116	12	28	4,741
1909.....	4,163	200	84	15	44	4,515
1910.....	4,113	183	114	16	14	4,440
1911.....	4,006	152	110	5	..	4,273
1912.....	4,206	185	92	..	..	4,483
1913.....	3,679	209	93	..	..	3,981
1914.....	3,370	154	70	..	..	3,594

number of graduates from the non-sectarian colleges was 3,365, or 314 less than last year, and 841 less than in 1912. It is a decrease of 1,825 (35 per cent.) below 1904, when 5,190, the largest number, were graduated from non-sectarian colleges. From the homeopathic colleges there were 154 graduates, or 55 less than in 1913, and 31 less than in 1912. It is a decrease of 266 (63 per cent.) below 1903, when 420, the largest number of homeopathic physicians, were graduated. The eclectic colleges graduated 70, or 23 less than last year, and 40 less than in 1911. It is a decrease of 151 (68.3 per cent.) below 1890, when 221, the largest number of eclectic physicians, were graduated.

GRADUATES HOLDING DEGREES IN ARTS

Of the 3,594 medical graduates, 807, or 22.5 per cent., were reported to hold also degrees in arts or science, as compared with 18.9 per cent. last year, 17 per cent. in 1912, 16.5 per cent. in 1911 and 15.3 per cent. in 1910. Of the 3,365 non-sectarian school graduates, 794, or 23.5 per cent., were reported to have baccalaureate degrees, while of the homeopathic graduates, 7, or 4.5 per cent., were so reported, and of the eclectic graduates, 6, or 8.6 per cent., were reported as holding degrees from colleges of liberal arts. As will be noted by referring to Table 14, of the 807 graduates holding baccalaureate degrees, 127—the largest number—came from Illinois colleges, followed by 97 from New York, 90 from Maryland, 79 from Pennsylvania and 70 from Massachusetts. It is noted that, as expected, the percentage of graduates holding collegiate degrees is gradually increasing and will con-

tinue to increase, particularly in the non-sectarian colleges, because a larger number of medical schools are requiring college work for admission.

TABLE 6.—MEDICAL GRADUATES WITH LIBERAL ARTS' DEGREES

Year	Non-sectarian			Homeopathic			Eclectic			Totals		
	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.	Graduates.	A.B., B.S.	Per cent.
1910.....	4,113	664	16.1	183	13	7.1	114	3	2.6	4,440	680	15.3
1911.....	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912.....	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913.....	3,679	732	19.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914.....	3,370	794	23.5	154	7	4.5	70	6	8.6	3,594	807	22.5

WOMEN IN MEDICINE

During the past year there were 631 women studying medicine, or 9 less than last year, a decrease of 48 below 1912 and a decrease of 498 (44.1 per cent.) below 1904, when 1,129 women students, the largest number, were reported. The percentage of all medical students was 3.8, the same as last year. There were 121 women graduates this year, or 3.4 per cent. of all graduates. Of all the women matriculants, 135 (21.4 per cent.) were in attendance at the two medical colleges for women, while the remaining 496 (78.6 per cent.) were matriculated in the 54 coeducational colleges. From the two women's colleges there were 25, or 20.7 per cent. of all women graduates, while 96, or 79.3 per cent., secured their degrees from coeducational colleges.

TABLE 7.—WOMEN IN MEDICINE

Year.	Total women students.	Percentage of all students, both sexes.	Total women graduates.	Percentage of graduates, both sexes.	Women's colleges.	Students.	Percentage of all women students.	Graduates.	Percentage of all women graduates.	Co-ed. schools.	Students.	Percentage of all women graduates.	Graduates.	Percentage of all women graduates.
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	85.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	2	124	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.5	64	536	78.9	110	77.5
1913	640	3.8	154	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78.6
1914	631	3.8	121	3.4	2	135	21.4	25	20.7	54	496	78.6	96	79.3

NUMBER OF COLLEGES

Until last year no exact data were available on which absolute statements could be made regarding the number of medical schools existing in the various years prior to 1900. Through the work of the council on Medical Education, however, sufficient reliable data regarding all medical schools were collected and the chart prepared which was published last year,[1] from which the actual number of schools existing in any one year could be positively stated. Table 8 allows of comparisons between the number of colleges existing in recent years.

Since June 30, 1913, six colleges (mentioned on page 681) have suspended or merged with others, leaving 101 medical colleges still existing. The number of colleges is the smallest number since 1880. It was about that time that the movement toward establishing commercial medical colleges became most marked, and the rapid increase in the number of colleges has been paralleled only by the rapid decrease since 1904. There has been a net decrease of sixty-one colleges since 1906, when there were 162 and when this country had about one-half of the world's supply of medical colleges! Eighty-five colleges have been closed by merger or otherwise since 1904, but in the same time twenty-four new colleges were organized, leaving 101 medical colleges which still exist.

The non-sectarian (regular) colleges number 87, a decrease of 5 since last year. The homeopathic colleges number 10, the same as last year and the eclectic colleges number 4, a decrease of 1 since last year. The non-sectarian colleges show a net reduction of 43, or 33.1 per cent., since 1906, when there were 130, the largest number of non-sectarian medical colleges. The homeopathic colleges show a net decrease of 12, or 54.5 per cent., since 1901, when 22, the largest number of homeopathic colleges, were in existence. The eclectic colleges show a net reduction of 6, or 60 per cent., since 1901, when there existed 10, the largest number of eclectic colleges.

TABLE 8.—MEDICAL COLLEGES

Year.	Non-sectarian.	Homeopathic.	Eclectic.	Physio-Med.	Nondescript.	Total.
1850.....	44	3	4	1	..	52
1860.....	53	6	4	2	..	65
1870.....	60	8	5	2	..	75
1880.....	76	14	8	2	..	100
1890.....	106	16	9	2	..	133
1900.....	126	22	9	2	1	160
1901.....	125	22	10	2	1	160
1902.....	126	20	9	3	2	160
1903.....	126	20	9	3	2	160
1904.....	127	19	9	3	2	160
1905.....	125	19	9	3	2	158
1906.....	130	19	8	3	2	162
1907.....	127	18	9	3	2	159
1908.....	120	18	9	2	2	151
1909.....	115	15	8	1	1	140
1910.....	109	12	8	1	1	131
1911.....	103	12	7	..	..	122
1912.....	101	11	6	..	..	118
1913.....	92	10	5	..	..	107
1914.....	87	10	4	..	..	101

FEWER BUT BETTER COLLEGES

Of the eighty-five medical colleges which have ceased to exist since 1904, forty-nine were closed by merger and thirty-five became extinct. It is noteworthy that this rapid diminution in the number of colleges began with the creation of the Council on Medical Education in 1905. The largest numbers closing in single years were ten in 1907, when the Council's first classification of medical colleges was prepared, thirteen in 1910, when the second classification was published, and fourteen in 1913, when the third classification was made public.

1. Life Chart of the Medical Colleges in the United States, THE JOURNAL A. M. A., Aug. 23, 1913, p. 578.

It is interesting to note that of the eighty-five medical colleges which have been closed, 44 were rated by the Council on Medical Education in Classes A and B and 41 in Class C. It is also interesting to note that 41, or 93 per cent. of the closures of the medical colleges in Classes A and B were through merger with other colleges, while of the Class C colleges which closed only six, or less than 15 per cent., were through merger with other colleges. In fact, all but three of the colleges which became extinct had been rated in Class C by the Council on Medical Education.

TABLE 9.—COLLEGES CLOSED SINCE 1904

Year.	Class A.*		Class B.		Class C.		Totals		Total Closed
	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	
1905.....	8	1	..	..	..	..	8	1	9
1906.....	..	..	..	..	..	..	..	..	..
1907.....	3	..	3	1	..	3	6	4	10
1908.....	2	..	2	..	1	4	5	4	9
1909.....	5	..	2	..	..	7	5	7	12
1910.....	1	..	3	..	3	6	7	6	13
1911.....	..	..	3	..	1	3	4	3	7
1912.....	2	..	..	..	..	3	2	3	5
1913.....	3	..	6	1	1	3	10	4	14
1914.....	..	..	..	..	2	4	2	4	6
Totals...	22	1	19	2	8	33	49	35	85

* Based on the classifications of medical colleges prepared by the Council on Medical Education.

While the total number of colleges is growing smaller, however, and *approaching more nearly the normal supply for this country,* it is encouraging to note that the number of high-grade, stronger medical colleges is constantly increasing. In 1904 only four medical colleges were requiring any preliminary education in advance of the usual high-school education; now there are eighty-four[2] requiring one or more years of advance college work and several others which begin the higher requirement next year. Of these eighty-four colleges, there are thirty-four which are requiring two years or more of collegiate work for admission. Many of the colleges have been remarkably improved also in regard to buildings, new laboratories, better equipment, larger hospital facilities and —most important—more and better full-time, salaried instructors.

TABLE 10.—REDUCTIONS IN NUMBERS OF MEDICAL COLLEGES, STUDENTS AND GRADUATES

Numbers	Non-sectarian			Homeopathic			Eclectic			Totals		
	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.	Colleges.	Students.	Graduates.
Largest....	130	24,930	5,190	22	1,909	420	10	1,014	221	162	28,142	5,747
Present....	87	15,438	3,370	10	794	154	4	270	70	101	16,502	3,594
Decrease...	43	9,492	1,820	12	1,105	266	6	744	151	61	11,640	2,153
Percentage	33.1	38.1	35.1	54.5	57.9	63.3	60.0	73.4	68.3	37.7	41.4	37.5

2. See list on page 671.

It is interesting to note that of the eighty-five medical colleges which have been closed, 44 were rated by the Council on Medical Education in Classes A and B and 41 in Class C. It is also interesting to note that 41, or 93 per cent. of the closures of the medical colleges in Classes A and B were through merger with other colleges, while of the Class C colleges which are scarcely possible, owing to the fact that the schools differ as to sect or race, leaving eleven cities where mergers are still possible. These cities and the number of colleges in each are as follows: Chicago, 8; New York, 7; Philadelphia, 6; Boston, 4; San Francisco, 4; St. Louis, 4; Baltimore, 3; Los Angeles, 3; Washington, 3; Dallas, 2, and Omaha, 2. In 1904 there were twenty-four cities having each from two to eight non-sectarian medical schools.

Each of the most famous medical centers in Europe —for example, Berlin, Paris, Vienna—has but one large medical school which makes systematic and practical use of the clinical facilities of the respective city. There is no valid reason why this country should not have equally famous medical centers, but the highest development is prevented by the existence of too many competing medical schools. For the further improvement not only of undergraduate but also of postgraduate medical instruction in this country, there should be other mergers in the eleven cities named.

TABLE 11.—CITIES HAVING TWO OR MORE MEDICAL COLLEGES

City	A+	A	B	C	Total
Chicago.....	2	1	3	2	8
New York.....	3	1	2	1	7
Philadelphia.....	1	4	1	..	6
Boston.....	1	2	..	1	4
San Francisco.....	2	..	1	1	4
St. Louis.....	1	1	..	2	4
Baltimore.....	1	2	..	..	3
Washington.....	..	3*	..	..	3*
Los Angeles.....	..	..	1	2	3
Ann Arbor.....	1	1	..	..	2
Cincinnati.....	1	..	1	..	2
Cleveland†.....	1	..	..	1	2
Dallas.....	..	..	1	1	2
Iowa City.....	1	1	..	..	2
Kansas City.....	..	..	..	2	2
Memphis.....	..	..	1	1*	2*
Nashville.....	..	2*	..	..	2*
Omaha.....	..	1	1	..	2

* One school for the colored race.
† One school contemplates removal to Columbus.

FURTHER MERGERS NEEDED

There are still eighteen cities each of which has two or more medical schools, and in seven of these mergers

LENGTH OF TERMS

The length of term of each college fluctuates somewhat from year to year, but on the whole, during the last twelve years there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Only two colleges this year reported sessions shorter than twenty-nine weeks, whereas in 1901, one hundred colleges reported sessions of from twenty-three to twenty-eight weeks. Four colleges claim courses of twenty-nine or thirty weeks of actual work, twenty-five claim courses of thirty-one or thirty-two weeks, and forty-one, the largest number, claim courses of from thirty-three to thirty-four weeks. Of the 101 colleges now existing, 94, or 94.1 per cent., now claim to require from thirty-one to thirty-six weeks of actual work, exclusive of holidays, as compared with 91.5 per cent. in 1913, 85 per cent. in 1912, 76 per cent. in 1910, 42 per cent. in 1904 and only 30 per cent. in 1901. The one college claiming a course of thirty-seven weeks is a night school, but it would require twelve or fourteen years of the usual night school study to obtain the equiva-

lent of four years of thirty-two weeks each in one of the better day colleges.

TABLE 12.—COLLEGE TERMS

Year.	23 to 26 weeks.		27 to 28 weeks.		29 to 30 weeks.		31 to 32 weeks.		33 to 34 weeks.		35 to 36 weeks.		Over 36 weeks.	
	No.	%	No.	%	No.	%	No.	%	No	%	No.	%	No.	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	....	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	....	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	....	2	2.0	4	4.0	25	24.8	41	40.5	28	27.7	1	1.0

TUITION AND OTHER FEES

Special attention is called in Table 1 on Page 672 to the total amount charged by the various colleges per annum for tuition, matriculation, laboratory and graduation fees for each student. In Table 13 the 101 remaining colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education in Classes A, B and C. Fourteen colleges charge fees of $100 or less per year, sixty-six between $100 and $175, and twenty-one charge above $175. Of the fourteen colleges charging $100 or less, eight, or nearly two-thirds, were listed among Class A (acceptable) colleges[3] by the Council on Medical Education, three were in Class B and three of them are found among the Class C colleges. Among the eight Class A colleges having these low fees are the schools of medicine of the state universities of Colorado, Mississippi, Missouri, North Dakota, South Dakota, Texas and Utah. On the other hand, eleven colleges listed by the Council in Class C charge fees of from $100 to $175 per year for each student. As shown on page 670, diplomas from Class C colleges are reported as not recognized by thirty-one state licensing boards. It is a question, therefore, why a student should spend his time and money in a low-grade college the diplomas of which are not recognized in many states,[4] when in the same time and with even less money he can attend one of the best-equipped colleges, the diplomas of which are recognized in all states. Although thirty-seven colleges listed in Class A charge fees ranging from $150 to $275 per year for each student, the actual expense for teaching that student in these colleges amounts to from two or three, to several times these sums. In fact, accurate data secured from sixty-five medical colleges a few years ago showed that the average amount received each year from the individual student was $122, while the average amount actually expended in the training of that student for a year was $410! The excesses of cost over income per student in several schools were, respectively, $2,744, $1,863, $897, $747, $730, $673, $518 and $500. The excess of expense over income from fees per student was over $200 in twenty-eight of the medical colleges which reported. It is also clearly evident that with the same equipment and at practically no additional expense these schools could easily accommodate two, three, or in some instances several times the number of students at present enrolled, which would greatly reduce the disproportion of expense over income from fees. A further reduction in the vast oversupply of medical schools in this country, therefore, would be in the interests of economy as well as of marked advantage to medical education.

TABLE 13.—COLLEGE FEES

Tot.. Fees	Number of Colleges			
	Class A*	Class B	Class C	Total
$ 50 or less	3	2	..	5
50 to $ 75	5	1	1	7
75 to 100	..	..	2	2
100 to 125	11	6	6	23
125 to 150	12	6	4	22
150 to 175	18	2	1	21
175 to 200	12	2	..	14
200 or above	7	..	..	7
Totals	68	19	14	101

* Based on the latest classification of medical colleges prepared by the Council on Medical Education.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois has heretofore had the largest number of medical colleges, but now, as shown in Table 14, the first place is held by New York, where there are ten colleges. California and Illinois each has eight and Missouri and Pennsylvania each has seven colleges. Illinois still has the largest number of students enrolled, having 2,474 matriculants last session, followed by New York with 2,153, Pennsylvania with 1,675 and Tennessee with 1,209. In regard to the graduates, the same relative position obtains.

Table 15 shows the colleges existing during the last session and their students and graduates grouped according to their rank in the third classification of the Council on Medical Education. As will be noted, there were sixty-eight colleges in Classes A+ and A and 20 each in Classes B and C. It is encouraging to note that 74.7 per cent. of all students are enrolled in the 63 per cent. of colleges which are in Classes A + and A, and that these colleges turn out 73 per cent. of all graduates. At the other extreme, only 8.1 per cent. of all students and 7 per cent. of all graduates are from the 18.5 per cent. of colleges rated in Class C.

HOME STATES OF MEDICAL STUDENTS

Table 2, on 676 to 679, shows from what states the students come who were in attendance at each medical college during the session of 1913-1914. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute

3. See list on page 669.
4. See also in THE JOURNAL of May 23, 1914, p. 1650, the table showing in what states the diplomas of the various medical colleges are not given full recognition.

TABLE 14.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

State	Colleges		Students		Graduates		Graduates with B.S. or A.B.
	Total	Class C	Men	Women	Men	Women	
Alabama	2	..	151	...	51	...	5
Arkansas	1	..	94	1	34	...	1
California	8	3	469	85	78	14	29
Colorado	1	..	53	1	16	1	9
Connecticut	1	..	49	...	8	..	8
Dist. of Columbia	3	..	377	3	68	1	8
Georgia	2	..	646	...	186	...	7
Illinois	8	2	2,331	142	570	26	127
Indiana	1	..	128	5	20	2	10
Iowa	2	..	110	3	13	...	7
Kansas	1	..	102	3	9	1	9
Kentucky	1	..	278	...	54	...	5
Louisiana	1	..	227	...	77	...	21
Maine	1	..	67	...	19	...	9
Maryland	3	..	974	24	235	11	90
Massachusetts	4	1	783	56	152	9	70
Michigan	3	..	578	26	110	2	22
Minnesota	1	..	162	7	28	2	26
Mississippi	1	..	35	...	...	...	...
Missouri	7	4	615	20	150	7	30
Nebraska	3	1	281	14	49	2	11
New Hampshire	1	..	23	...	6	...	5
New York	10	1	2,077	76	432	15	97
North Carolina	3	..	252	3	36	...	5
North Dakota	1	..	13	1	...	...	...
Ohio	5	1	647	13	130	4	44
Oklahoma	1	..	94	...	14	...	...
Oregon	1	..	77	2	25	1	3
Pennsylvania	7	..	1,570	105	373	19	79
South Carolina	1	..	104	...	19	...	6
South Dakota	1	..	14	...	...	...	...
Tennessee	4	1	1,197	12	258	1	19
Texas	4	..	306	15	66	3	12
Utah	1	..	19	1	...	...	...
Vermont	1	..	117	...	39	...	2
Virginia	3	..	490	...	105	...	17
West Virginia	1	..	18	3	...	...	...
Wisconsin	2	..	243	9	49	...	4
Totals	101	14	15,871	631	3,473	121	807
Average per College	...	..	157	6	35	2	8

more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based in state board examinations,[5] which show the distribution of the alumni of each college, is interesting. The college which has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York, with 2,100. Pennsylvania contributed 1,341 and Illinois 1,258. The next states, in the order of the number of students contributed, are: Ohio, 791; Massachusetts, 701; Georgia, 598; Texas, 573; Missouri, 528, and Tennessee 499. Four states had less than 20 each, these being Arizona, 16, Wyoming, 11; New Mexico, 7 and Nevada, 3. There were 126 students from Hawaii, Porto Rico and the Philippine Islands, and 555 students from foreign countries.

In Table 3, on page 680, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year in all colleges is larger than that of the second year by 703. More interesting, however, is the study of this table in the light of higher entrance requirements which have been adopted during the last two or three years by a large number of colleges.[6] The effects of these higher requirements are shown in the figures in two ways: smaller enrolments for the colleges which have adopted the higher requirements and larger enrolments for the colleges which have retained the lower requirements. The benefit in larger classes for the "stand pat" colleges can be only temporary, however, so decided is the trend for the higher standards. Already twenty state licensing boards have gone on record for the higher requirements and others are contemplating similar action. The House of Delegates of the American Medical Association in June, 1912, adopted a report instructing the Council on Medical Education to omit from the acceptable list any medical college which after Jan. 1, 1914, does not require for admission in addition to the four-year high-school education, at least one year of higher preliminary work, including courses *of college grade* in physics, chemistry and biology. The Association of American Medical Colleges has adopted a similar requirement. The medical profession in the United States, therefore, has gone on record for entrance qualifications

TABLE 15.—STATISTICS ACCORDING TO COLLEGE CLASSIFICATION

	Colleges*		Students		Graduates	
	No.	Per Cent.	Number	Per Cent.	Number	Per Cent.
Class A+	29	26.9	5,804	35.7	1,218	33.9
Class A	39	36.1	6,442	39.0	1,408	39.1
Class B	20	18.5	2,838	17.2	686	19.0
Class C	20	18.5	1,328	8.1	282	7.0
	108	100.0	16,502	100.0	3,594	100.0

* Includes 7 colleges which will hold no more sessions.

which bring medical education in this country more nearly on a par with the requirements of other countries.

RELATIONS WITH BETTER HOSPITALS

Another great wave of improvement, already well begun, is the establishing of closer relationships between hospitals and medical schools, whereby each of the hospitals will have on its attending staff the most skilled physicians who are engaged in teaching and research, and the medical school will possess a teaching hospital in which students may see and study patients at the bedside. This closer relationship is a direct acknowledgment on the part of the hospital that the medical school has improved to such an extent that it is a real honor and a benefit to have a closer relationship with it. This closer relationship undoubtedly means that the hospitals will be conducted along more modern lines since on their atttending staffs they will have physicians who are in touch with the latest improved methods of diagnosis and treatment. This relationship means that medical students will be given a better training in the examination and care of patients and that—most important—the public will in future be supplied with better qualified physicians.

5. THE JOURNAL A. M. A., May 23, 1914, page 1640.
6. See lists on page 671.

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SATURDAY, AUGUST 22, 1914

DIETARY TREATMENT AND THE SUGAR CONTENT OF THE BLOOD IN DIABETES

The significance of the sugar-content of the blood in the diagnosis and prognosis of certain disturbances, notably diabetes mellitus, is beginning to be recognized. Data are rapidly accumulating from which it will soon be possible to formulate standards and variations which may be taken as indicative of fairly definite perversions of function. The influence of the ingestion of various kinds of carbohydrates on the level of sugar concentration in the blood has been clearly established, as has the fact that the blood-sugar content of the diabetic departs from the normal both with respect to the existence of a hyperglycemia and in its unlike response to altered alimentary conditions.[1]

If there is any aspect of the subject respecting which the records furnished by the new mode of investigation are not yet as complete as might be desired, it is in connection with the influence of the routine dietary treatment of diabetes on the hyperglycemia. Extensive statistics in this field can be obtained only from the larger hospitals and sanatoriums in which suitable patients and adequate laboratory facilities are available. A series of cases studied with reference to some of the features here emphasized has just been reported from the Rudolf Virchow-Krankenhaus in Berlin.[2] The introduction of a carbohydrate-free regimen consistently produced a decrease in the sugar content of the blood in such cases as were not complicated with chronic nephritis. The extent of the diminution corresponded in general with the severity of the disease. Cases of the mildest type of diabetes were brought to a sugar level characteristic of the normal in perfect health. Moderately severe cases under the same dietary regulations reached a definite level of the blood-sugar which was as a rule higher than the normal, fluctuated with the severity of the symptoms, and was rather unresponsive to further rigorous treatment. Patients in this class usually reacted to the feeding of carbohydrate more intensely in the direction of increased hyperglycemia than did those exhibiting a less severe diabetes. No variations from these general rules were brought about by such complicating factors as tuberculosis of the lungs, cirrhosis of the liver, or arteriosclerosis.

It is a significant and perhaps unexpected fact that when the lower level of blood-sugar, whatever its figure, characteristic of each case, was once reached, further restrictions in the diet produced no additional lowering of the glycemia. Even after a diminution in the protein intake, as on the days on which green vegetables formed the chief ingredient of the diet, thus approaching a partial starvation level, no reduction of the sugar content was manifested in the blood, although the glycosuria sometimes disappeared at this time. Herein the analysis of the blood reveals a picture not afforded by the examination of the urine alone. It is also worthy of note that on the "oatmeal days," the blood-sugar was, if anything, increased in the cases investigated.

In cases that ended by death in coma the patients showed an increased hyperglycemia, even though they were fasting prior to the examination. In such conditions it seems necessary to assume severe disturbances in intermediary metabolism. The symptoms in nephritic persons were also divergent in some cases. Although in suitable instances the urine frequently became free from sugar after the customary diet restrictions, the sugar-content of the blood was invariably above normal. In some cases, for example, those with contracted kidneys, the hyperglycemia increased even when the glycosuria had permanently disappeared. It is evident, therefore, that such studies on the blood serve as a valuable supplement to other current methods of routine examination. They may furnish evidence of a latent defect of metabolism when it no longer manifests itself by way of more familiar methods.

1. The Variations in the Content of Sugar in the Blood, editorial, The Journal A. M. A., Jan. 10, 1914, p. 131; Adrenal Glycosuria in Man, ibid., March 21, 1914, p. 938.

2. Wolf, L., and Gutmann, S.: In welcher Weise wirken Diätkuren auf das Verhalten des Blutzuckers bei Diabetikern? Ztschr. f. klin. Med., 1914, lxxix, 394.

A RARE ANIMAL PARASITE OF MAN

The extension of medical research into the field of the tropics has brought many novelties and rarities into prominence. One of these is a variety of parasites which infest either man or animals or both. The parasitic invaders of the blood-stream have received most attention, in part because the blood is easily made available for examination. Interest is at present especially centered on the alimentary parasites; and increased necropsies in those countries where the unusual organisms are likely to be revealed have resulted in considerable progress in knowledge. The value of a systematic and thorough study of every branch of parasitology does not consist solely of the possibility of eradicating objectionable causes of dis-

ease or of relieving the distress produced by some of the undesired invaders of the body. The study of the life-history of even the most uncommon and unimportant of these forms of animal existence may throw light on related harmful species and through the information gained give us more effective means of avoiding or combating parasitic infections. For this reason any advance in the field of parasitology should awaken interest quite aside from the immediate promise of useful application. We sometimes need to recall how few years have elapsed since the suspicion arose of the interrelation of insects and disease.

One of the rarities of tropical medicine, namely, oesophagostomiasis, a disease attributable to a parasitic worm of the genus *Oesophagostoma*, was first described by Brumpt in 1905, in a negro from the Omo River near Lake Randolph, East Africa. According to the very few reports of cases, the malady is characterized by features somewhat akin to hookworm. Hemorrhagic cysts or tumors in the submucosa or muscularis of the large intestine—rarely of the small intestine — usually project both inside and outside of the canal, and contain the immature adult oesophagostoma. At maturity the cyst ruptures and the adult worm escapes into the lumen of the intestine. The ruptured cysts may be invaded by intestinal bacteria, with resultant ulcerations, perforation of the intestine and peritonitis.

Various animals are subject to oesophagostomiasis, but in most of them the infection appears to be due to species of parasites other than that which inhabits man. The worms which are commonly found in the intestines of apes and are known as *Oesophagostoma apiostomum* have been regarded by Leiper of the London School of Tropical Medicine as identical with the specimens obtained from African natives and originally named *Oesophagostoma brumpti*. The study of the development of the forms found in the monkey has therefore been begun in the Bureau of Science at Manila.[1] The ova can be recovered from the feces, and their development takes place in cultures made in the same manner as for the ova of the hookworm. The larva grows rapidly, and under favorable conditions of culture and temperature attains its maturity in from three to four days. In the process of growth it molts twice. At the last molt the skin is not shed, but remains as a sheath enclosing the larva. In this matured form differing in size and shape from the mature larva of the hookworms and strongyloides, it is ready to infect a new host. Walker points out that this development is strikingly similar and wholly comparable with that of *Ankylostoma duodenale*, which is perhaps to be expected from the somewhat near relationship of the two worms. From this similarity one might expect by analogy that the method of entrance of the larva into the body of the host would also be similar. The question as to the way in which it attains its position in the tissues of the large intestine can now be solved experimentally, owing to these successful preliminary studies in government laboratories in the Philippines.

1. Walker, E. L.: The Life History of Oesophagostomum Apiostomum: I. Development Outside of the Host, Philippine Jour. Sc., Trop. Med. (B), 1913, viii, 501.

ABUSE OF SPECIAL PRIVILEGE

Many of the prominent newspapers of the country have recently been sent printed copies of a committee document from the United States Senate which was printed for the use of the Committee on Public Health and National Quarantine of the second session of the Sixty-Third Congress. Its title is "Arsenization Method of Preventing Yellow Fever," and it is "a memorial praying that publicity be given by the government to the arsenization method of preventing yellow fever as practically demonstrated in the epidemic at New Orleans, Louisiana, 1905." While the matter has merely been referred to the Committee on Public Health and National Quarantine, and the committee has not yet reached any decision in the matter, the first page bears the words "printed for the use of the committee," and the distribution of these committee documents to the newspapers is actually a definite endeavor to secure through the government printing office the publicity prayed for while the matter is before the committee and without waiting for its decision in the matter.

For the proper information of the newspapers it seems to us unfortunate, or at least lacking in that courtesy that publicity seekers should cultivate, that Senate Document No. 111, printed for the second session of the Fifty-Fifth Congress and dated February, 1898, just sixteen years to the month before the subsequent document, was not submitted at the same time to the editorial writers. The title of this is "Arsenization Method of Treating Cholera." The previous memorial also was referred to the Committee on Public Health and National Quarantine in order to be printed. It contained a similar request from the author of the present appeal praying that a test be made of the arsenization method of treating the disease of cholera. The earlier pamphlet is the best possible commentary on the later document which newspapers are now requested to comment on.

Proverbially the hardest thing in the world in logical reasoning is to prove a negative. An immense amount of observation would have to be made in order to demonstrate that the taking of arsenic in certain quantities prevented the development of a specific infectious disease. That it should prevent two such very different specific infections as cholera and yellow fever raises the difficulty of the solution of the problem almost to what mathematicians would call the nth degree. There are almost necessarily millions of people, always hundreds of thousands, in any country

in which such an infection is epidemic, who do not come down with the disease that affects so many of those around them. This has always been true. Their vitality renders them capable of immunizing themselves against the infection. Any of the manifold substances, food materials or drugs that they have been taking might be asserted to be the origin of their immunity. Only the most careful differential investigation under very favorable circumstances for the elimination of disturbing factors would lead to a definite conclusion of any value under such circumstances.

It is interesting to read the account furnished in the latest Senate committee document of the large number of persons who on the bare possibility that arsenic, though in itself a seriously poisonous drug, might help in protecting them from yellow fever, took it in considerable quantities during the epidemic in New Orleans in 1905. The prescription to "take one-one-hundredth of a grain of arsenious acid three times a day for the first week of exposure to infection, twice a day the second week, and once daily thereafter until the remainder of one hundred tablets [why one hundred, except that it is a nice round number, is not clear], granules or powders are taken, or until the epidemic is closed by virtue of sanitary or hygienic precautions or weather conditions" was widely published in the newspapers of the South and "was taken up by the populace of the threatened city in a truly astonishing manner." There was an almost unprecedented rush for the new prophylactic. "Jobbers and wholesalers soon ordered in lots of a million, until upon investigation by representatives of well-known publishing houses it was learned that between fifteen and twenty millions of this particular tablet had been supplied to the trade of New Orleans within the preceding twenty-three days, with many more millions to the trade of outlying infected districts."

Indeed, the only parallel in medical history that we know to such an enormous consumption of a drug is the marvelous spread of the use of tobacco, especially chewing tobacco, when the weed was first introduced. Tobacco was declared to be a wonderful tonic strengthener of the system, a marvelous discovery of the Indians, who by it secured long life and freedom from disease, and above all it was declared to be the most potent of prophylactics. The tradition that was created was so strong that there are still some remnants of it left in the folklore and the popular medicine of all nations. Many a person is still persuaded that to take a chew of tobacco before approaching a small-pox patient or sufferer from other malignant disease is a protective. Undertakers and their helpers still pass on the tradition, in country places at least. In spite of kings and government authorities then and the general condemnation of the learned with even the outspoken disapproval of the church, the use of tobacco spread. That was in the seventeenth century, and we sometimes think that we have progressed beyond the rather childish state of mind which we are inclined to attribute to that period. Incidents like the present raise the question whether or not we have progressed.

In the meantime, the sending of these copies of a document printed at government expense for the use of the Senate committee to the newspapers of the country is an abuse of privilege that deserves severe condemnation. The Committee on Public Health and National Quarantine surely is not willing to allow its privileges to be thus abused, and cannot permit itself to be made a party to this method of securing publicity for a remedy whose efficiency is eminently doubtful and interest in which might well serve to obscure the significance of the true method of preventing yellow fever by eliminating the mosquito, which has been demonstrated to be so effective.

CHOICE OF A MEDICAL SCHOOL

Never before has the choice of a medical school been so simple and easy as at the present time, owing to the abundance of information which is available for the student's guidance. And never was it so important that a careful and wise choice be made.

Formerly the training secured in any medical college was sufficient to give the physician a start in his life work, and to secure a license to practice was also a simple matter. Not so at the present time. Modern medicine is based on scientific knowledge, and without this knowledge the physician of the future will be a failure. To secure such knowledge the student must have a better preliminary education than formerly, and must secure his medical education in a college which has a corps of expert, salaried teachers, well-equipped laboratories and an abundance of dispensary and hospital facilities. Now also definite qualifications are demanded by the various states before the license to practice can be secured.

Before choosing a medical school the student should acquaint himself with the requirements of preliminary and medical education held by the various state licensing boards. These standards have recently been advanced in several states and are bound to be advanced in others in the early future. At present seven states[1] require as the minimum standard of preliminary education two years of liberal arts' college work in addition to a four-year high-school education. In thirteen other states[2] the minimum standard is one year of collegiate work, in addition to the high-school education. If, therefore, a student is intending to practice in one of these twenty states, it will be necessary for him to have the required amount of preliminary education. If the student needs additional preliminary training, the time to acquire it, of course, is

1. Alabama, Colorado, Indiana, Iowa, Minnesota, North Dakota and South Dakota.
2. Arkansas, California, Connecticut, Kansas, Kentucky, Illinois Michigan, New Hampshire, Pennsylvania, Rhode Island, Utah, Vermon. and Virginia.

before he begins the study of medicine. In fact, this higher preliminary education is now required by all of the better medical colleges. More important, however, a good preliminary education is essential in order that the student may be enabled to master the more complex problems of the modern medical course.

Another very important matter for the student to consider is the character of the college itself. State licensing boards are now making more common use of their legal power to discriminate between medical colleges and to refuse recognition to those which are deemed not properly qualified to furnish a training in modern medicine. Diplomas from those not recognized do not constitute acceptable qualifications for the license to practice medicine in such states. It is important for the student to make sure not only that he has the adequate preliminary education, but also that he shall obtain his training in a medical college which is given recognition in all states.

The question is: How may the student secure the information needed on these matters? Some medical colleges advertise extensively in the newspapers and in popular magazines, and send out announcements and circulars containing very glowing, if not misleading statements. At present several medical schools are being thus extensively advertised, even though their diplomas are not recognized in from twenty-five to thirty states! It is hardly to be expected that the announcements sent out by these schools will convey the information which the prospective students need. It is essential, therefore, that before choosing a medical school, he should secure further information from impartial and reliable sources, so that he may be sure that he is not enticed into a poorly equipped institution and find on graduation that his diploma is not recognized in a large number of states.

An important matter which the student is always bound to consider is the expense. But it is well for him to know that to enter a low-grade medical college because the fees may be a little lower is very poor economy. The truth is that in the same length of time, and often for even lower fees than he would pay in the poorly equipped institutions, he may acquire his education in one of the best-equipped medical schools in the land. This refers particularly to the medical departments of state universities. On the other hand, he should know that even if some of the better schools do charge higher fees, nevertheless, they spend on each student, per year, several times the amount of money that the student pays in tuition. Here again, it would be poor economy to enter a low-standard college which depends on students' fees alone for its income, when for a few additional dollars each year he can enter a thoroughly equipped institution and get a far better medical training. Even should he be required to work his way through college, in whole or in part, the opportunities for doing so are, as a rule, greater in the better than in the lower standard colleges. Generally, however, worthy students who are poor in purse are the very ones who appreciate not only the value of money but also the value of the medical course they are getting. Such students are seldom beguiled into a poor college by alluring and misleading advertisements.

In order that the student may be thoroughly informed in any and all of the foregoing matters it would be well for him not only to secure the announcements of a number of colleges among which he may be able to choose, but also to secure reliable information from other sources. He should read carefully the reports on medical colleges published from time to time in THE JOURNAL by the Council on Medical Education, which can be obtained in reprint form. After an extensive investigation, including several inspections, the various medical schools have been rated by the Council in four classes, namely, A+, A, B and C, depending on their excellence. If the student is otherwise in doubt, he will not make a mistake by choosing one of the colleges contained in the higher classification. If he has had two or more years of collegiate work in addition to a four-year high-school education, and if he earns his diploma at a college in the higher classification, there is no doubt regarding either the quality of the training obtained or his eligibility after graduation to obtain a license in any state of his choice.

The student must bear in mind that in his preliminary and medical training he is laying the foundation for the rest of his life. If a year or two more is needed to enter one of the better medical colleges, he may count it as time well spent, since he is all the more sure of having laid a solid foundation. The medical profession in this country is extremely overcrowded, but there is always room for physicians who are thoroughly competent. The opposite must not be forgotten: disappointed, indeed, will be that student who, because of alluring advertisements or because of lower entrance requirements, is induced to get his training in a poorly equipped college, and who finds after graduation that he is handicapped for life.

Current Comment

FEWER MEDICAL COLLEGES, STUDENTS AND GRADUATES

The statistics published this week show that in the last decade there has been a marked decrease (about 35 per cent.) in the number of medical colleges and corresponding reductions in the number of students and graduates. Of colleges the decrease was from 165 to 101; of students the decrease was from 28,142 to 16,502 and the number of graduates decreased from 5,747 to 3,594. There are some perhaps, who, not knowing the real cause, may look on these marked reductions with alarm and believe that this country will soon be suffering from a dearth of physicians. Alarming statements to that effect are already being

circulated, but invariably these statements come from those interested in medical colleges conducted more as business enterprises than as educational institutions; those who look more to the incomes from students' fees than to the quality of physicians turned out. There would not have been the marked reductions referred to had it not been for the vast oversupply of medical colleges existing in this country ten years ago. That there is room for a still greater reduction of medical colleges; that there is no cause for alarm regarding a scarcity of physicians, and that the reductions referred to are distinctly in the interests of the public, are clearly evident to any one acquainted with the facts.

REDUCING AN OVERSUPPLY

Prior to the Civil War there had been a rapid increase in the number of medical colleges, there being at the time about sixty in this country. Following the war, however, the number increased by leaps and bounds, until in 1906, not counting the out-and-out diploma mills, a maximum number of 162 colleges was reached. It was then discovered that this country alone had more medical colleges than all other countries of the world combined! The conditions were preposterous. Although an unusual but real demand for doctors, caused by the rapid development and growth of the country, was what originally led to the formation of proprietary medical colleges, nevertheless, not only was the demand soon supplied, but also there came to be so vast an oversupply as to be actually ridiculous. And such colleges! Although there were some fairly good ones, a very large per cent. were joint stock corporations, conducted solely for profit. They were devoid of equipment, few held seriously to any entrance standard, and whoever could pay the tuition fees—the only requirement—was admitted. In order to swell the number of students, and incidentally the income from fees, glowing advertisements were printed and salaried solicitors were sent to offices, work-shops and farms. Large classes were turned out each year after only two short sessions! Is it a wonder that there has been a marked decrease following the quiet but careful investigation of the Council on Medical Education? There is certainly no question that the great reduction in the number of medical colleges and the remarkable improvement in the quality of those remaining will result in a greatly improved medical profession and—more important—will insure for the people better qualified physicians.

NO DANGER OF A SCARCITY OF PHYSICIANS

That the marked reduction in the number of medical colleges during the last decade will result in a dearth of physicians in this country is a proposition which appears ridiculous to any one acquainted with the facts. The normal proportion of physicians to population in the leading nations of Europe is one to every 1,500 to 2,500 people; this country has one physician to every 600 to 650 people. The figures given for this country do not include the osteopaths, Eddyites and other so-called drugless practitioners, which are scarcely found in other countries. The annual loss of physicians from deaths in this country is approximately 2,000, while the annual output of physicians from the medical colleges for several years exceeded five thousand. Even this year there were 3,594 or nearly twice as many physicians added to the profession as are lost from deaths. It is evident, therefore, that if the annual number of graduates merely replaced the number of physicians removed by death it would still require many years before the supply of physicians would be reduced to the normal quantity needed. Just so long as the colleges continue to turn out more than the number removed by death, just so much longer will it be before the normal proportion is reached. Again, it is apparent that the sixty better medical colleges with their present equipment, and with little if any added expense, could easily take care of all the students at present enrolled in the 101. It is quite clear, therefore, that the number of colleges might be reduced by another fifty per cent. and there would still be no danger of a doctor famine. Thus far we have considered mere numbers. When we consider also the better trained physicians who are now being turned out in place of the product of former years, the danger of a lack of adequate medical service will be pushed still further away. The situation is simply this: A ridiculously large oversupply of exceedingly low-grade, commercial medical colleges with their enormous output of poorly educated doctors is rapidly giving way to a normal quantity—not reached yet—of high-standard educational institutions which are annually turning out a still comparatively large number of more thoroughly trained physicians. There is no question that the change is most beneficial to the public however one may look at it.

MEETING THE SHORTAGE OF IMPORTED DRUGS

Last week we commented[1] on the possible effect of the European crisis on our drug supply, especially the impending shortage of proprietary products (patented or trademarked) of foreign manufacture. As one of the first effects of this shortage physicians will learn that a large number of foreign products sold under proprietary names are available in this country under their non-proprietary, descriptive names if they will prescribe them. Among these may be mentioned dionin, which is offered by American manufacturers as ethyl-morphin hydrochlorid and to be included in the Pharmacopeia under this term; urotropin, which has long been available as hexamethylenamin; and diuretin, available as theobromin sodium salicylate. Atophan is not protected by patent and it is to be hoped that some enterprising American firm will very promptly undertake the manufacture of this product and that American physicians will just as promptly learn to prescribe it under a modified chemical name such as phenyl-quin or any other which may be officially adopted. As regards patented products which are the property of particular foreign firms: It should be demanded of such firms that they take prompt steps to secure the manufacture of these products in this

1. The Journal, August 15, p. 586.

country as has been done for some years, we are informed, in the case of acetylsalicylic acid (aspirin). If these firms are not in a position to establish factories of their own they will find little difficulty in securing the manufacture of their products by competent American firms. In the meantime Congress should revise the patent law to make it agree with that of most foreign countries; that is, the holder of a patent must under penalty of forfeiture begin manufacture of the patented product in this country in a reasonable period of time after the issuance of the patent. At the same time Congress might properly consider the feasibility of revoking foreign patents on medicinal products if their owners fail to take proper steps to secure for us a supply of the product by manufacture in this country if necessary.

PATENTS ON CERTAIN CHEMICALS EXPIRING

In connection with the shortage of foreign drugs, on which we comment elsewhere, it may be worth while to note that the patent rights on a number of familiar patented products have expired or are about to expire; for instance, the patents on euquinine, pyramidon and protargol have lapsed; those on orthoform-New and aristochin will expire in 1915 and 1916, respectively. Since these products will be public property after the dates indicated, American firms should lose no time in undertaking their manufacture. It should be remembered, however, that if substitutes are to be allowed, standardization should be demanded. Inferior substitutes are a menace greater than the lack of the original products. If salvarsan, neosalvarsan, protargol, etc., are to be made in America, our government should see to it that the American output equals the European product.

Medical News

ILLINOIS

New Officers.—Stark County Medical Association at Toulon, July 27: president, Dr. James R. Holgate, Wyoming; secretary-treasurer, Dr. Clyde Berfield, Toulon.

Illinois Physicians Abroad.—Dr. and Mrs. Harry E. Kerch, Dundee; Dr. James J. Moran, Spring Valley; Dr. Augustus W. Chandler, Rochelle, and Dr. William L. Gray, Champaign, are held in London on account of war conditions.——Dr. and Mrs. William R. Parkes, Evanston, returned from Europe, August 7.

Farm Cottage Annex.—The Illinois Board of Administration has decided to open a farm cottage annex to the Kankakee State Hospital on the site of the new Alton State Hospital. Three farm houses on this property are available, which will accommodate about one hundred patients who have almost recovered their mental poise.

Kane County Board Takes No Action.—Supervisor George F. Sills of Kane County calls attention to an error in THE JOURNAL of August 8, page 491. The committee of supervisors, as then stated, have prepared a report opposing the establishment of a county sanatorium, but no action has been taken on this report as there will be no meeting of the board until September.

Chicago

Personal.—Dr. John P. Sprague has been appointed professor of physical education and hygiene at Grinnell College, Grinnell, Iowa.——Dr. Otto L. Schmidt has been elected commodore of the Northwestern Yachting Association and of the Inland Lakes Yachting Association.

Home from Abroad.—The following physicians of Chicago have recently returned from abroad: Dr. and Mrs. Harry J. Stewart, Dr. Casey A. Wood, Dr. and Mrs. Junius C. Hoag, Dr. Wilhelm E. Krieger, Dr. Raymond W. McNealy, Dr. and Mrs. Edward L. Webb and Dr. Jabez D. Hammond.

Physicians Still Detained Abroad.—The following additional names of physicians detained abroad on account of the difficulty of obtaining passage by reason of war conditions are: Dr. and Mrs. Peter C. Schenkelberger, Dr. Paul Owsley, Dr. and Mrs. Alfred Schirmer and daughter, Dr. Ernest A. Loewinger, Dr. Robert H. Buck and Dr. Michael Goldenbuerg.

Cook County Hospital Opened.—The first building of the new Cook County hospital was opened August 15 without ceremony. The building at present in use is the administration hall which will accommodate 656 patients. The entire eighth floor of the building is arranged for surgical work. There are nine operation rooms including two amphitheaters. The silent-call signal system has been installed throughout the institution. The old hospital buildings are now to be wrecked to make room for the new structures which will cost when completed, $16,000,000.

KENTUCKY

State Association Meeting.—The annual meeting of the Kentucky State Medical Association will be held at Newport, September 24-26, with headquarters at the Carnegie Hall.

Personal.—Dr. Arthur L. Nelson has succeeded Dr. Evan E. Owen as secretary and assistant superintendent of the Louisville City Hospital.——Dr. David C. Morton, Louisville, professor of medicine in the University of Louisville and chairman of the City Hospital Committee, has resigned and retired from practice.

Pellagra Conference.—A pellagra conference was held by the State Board of Health in connection with the annual school of city and county health officers at Pineville, August 18 to 20. In addition to the study of pellagra there was an unusual clinic, and the duties of physicians and health officers under the new law in regard to trachoma and other diseases leading to blindness were fully discussed and explained. Special attention was also given to the study of the sanitation of small towns and country districts with a view to the prevention of typhoid fever.

MASSACHUSETTS

Insanity Board Organized.—The new Board of Insanity created under the law relative to the organization and powers of the State Board of Insanity, which went into effect August 1, was organized August 10, with Dr. Michael J. O'Meara, Worcester, president; Dr. L. Vernon Briggs, Boston, executive secretary, and M. Charles E. Ward, Buckland, as the third member. The appointments were made by the governor early in August.

Personal.—Dr. Milo A. Jewett has been appointed United States consul at Kiel, Germany.——Dr. Max Baff, Worcester, has returned from abroad.—Drs. Henry M. Chase and Hilbert F. Day have been appointed surgeons in charge of the Boston Dispensary to fill the vacancies caused by the retirement of Drs. Benjamin Tenney and John Homans, who have been placed on the consulting staff of the institution.——Dr. Simon F. Cox, superintendent of the Tuberculosis Hospital, Mattapan, since 1906, has accepted the position of superintendent of the New Haven hospitals.——Dr. Walter Channing, Brookline, a trustee of the Boston State Hospital, has resigned.

MICHIGAN

Hospital Merger.—Solvay General Hospital, Detroit, with a capacity of fifty beds was merged with the Harper Hospital, August 3. The merged institutions will be under the care of Dr. Wayne Smith, superintendent of the Harper Hospital.

Personal.—Dr. F. Elizabeth Barrett has succeeded Dr. Claude B. Fulkerson as medical inspector of the public schools of Kalamazoo.——Dr. Duncan McKellar, Hillsdale, who has been suffering eight weeks from septicemia, had his right leg amputated recently.

Veteran Honored.—Dr. Theodore A. McGraw, Detroit, in recognition of forty-five years of continuous service as a member of the medical board of St. Mary's Hospital, was honored June 30 by fifty of his associates who presented him with a silver vase as a token of love and appreciation from his co-workers in the hospital.

Michigan Physicians Abroad.—Drs. Ross U. Adams, Kalamazoo, and Francis H. Callow, Mt. Morris, have returned from Europe.——Dr. William F. Hake, Grand Rapids, is reported to have sailed from Europe August 6.——The following Michigan physicians are believed to be held in London by reason of the war situation: Drs. Charles H. Oakman, Angus McLean, James M. Robb, Roland E. Loucks, Ernest W. Haass, Max Ballin, George E. McKean, Don M. Campbell, Alexander W. Blain and J. Everett King, Detroit, and Drs. Charles E. Boys, Kalamazoo, Charles H. Baker, Bay City and Arthur L. Robinson, Allegan.

MINNESOTA

Medical Block Again Burned.—The third fire in four months in the Medical Block, Minneapolis, August 7, did damage amounting to $35,000.

New Officers.—Wabasha County Medical Society at Elgin, July 9: president, Dr. William B. Heagerty, Mazeppa, secretary-treasurer, Dr. William F. Wilson, Lake City.

Minnesota Physicians Abroad.—Dr. William R. Murray, Minneapolis, and Dr. Charles H. Mayo, Rochester, have returned from Europe.——Dr. Charles W. More, Eveleth, Louis A. Fritsche, New Ulm, Frank C. Davis, Minneapolis, and Rowland Gilmore, Bemidji, are believed to be detained in Europe on account of the war conditions.

Personal.—Dr. Ernest A. Anderson, Holdingford, has been elected a member of the board of supreme medical directors of the Modern Woodmen of America with his office at Rock Island, Ill.——Dr. H. G. Lampson has resigned as health officer of Rochester.——Dr. G. W. Moore has been elected mayor of Hopkins.——Dr. Rollo C. Dugan, Winona, has been appointed superintendent and chief surgeon of the hospital recently established in Ottawa, Kans., by the Businessmen's Association of that city. The hospital is located in the old Semple Sanitarium building.

NEW YORK

Sanitary Conference.—The annual sanitary conference of the State will be held in Saragota, September 15 to 17. In addition to the meeting of health officers there will be a sectional conference for registrars of vital statistics.

To Bar Useless Germicides.—A bill is being prepared by Senator William J. Heffernan of Brooklyn for introduction at the next session of the legislature to stop the sale of useless disinfectants. It is claimed that about 25 per cent. of the disinfectants now used are worthless. Maryland is the only state thus far having a law dealing with the sale of disinfectants.

New York City

Fewer Deaths Among Infants.—During the first week in August the total number of deaths among infants under one year of age was 331, or fifty less than during the corresponding period of 1913. Manhattan led in the decrease with 167 deaths as against 198 for the corresponding week of last year.

Brooklyn Hospital Purchases Site.—The Williamsburg Hospital, which has been located on Bedford Avenue for half a century has purchased a site for a new hospital at South Ninth Street and Driggs Avenue. It is intended to erect a modern hospital building early next year which it is expected will cost $125,000.

Personal.—Dr. Alexis V. Carrel of the Rockefeller Institute of Medical Research, who has been visiting his home at Lyons, France, has gone to the front as a surgeon with the French army.——Dr. Moses Kahn has resigned from the resident staff of Sea View Hospital to accept the position of assistant physician in charge of tuberculous cases at the Eloise Infirmary, Eloise, Mich.

High Cost of Food and School Children.—Dr. Sigismund S. Goldwater, Health Commissioner, announces that he proposes to make an investigation of the effect of the increased cost of food on the health of school children. The nurses who visit the school are to make a general examination in September and to make inquiries into the cause of lack of proper nourishment. The information presented will be submitted to the Mayor's Committee.

PENNSYLVANIA

Personal.—Dr. Mary M. Wolfe, Lewisburg, has been appointed superintendent of the State Institution for the Care of Feeble-Minded Women, near Hartleton.

Detained in Europe.—Drs. Oskar Klotz and James D. Heard, Pittsburgh, and Martin E. Griffith, Monessen, are detained in Europe on account of the prevalent war conditions.

Philadelphia

Personal.—Dr. McCluney Radcliffe received the degree of LL.D. from Pennsylvania College, Gettysburg, in June.——Dr. J. E. B. Buckenham was provisionally appointed as acting chief resident physician at the Philadelphia Hospital for Contagious Diseases, during the absence of Dr. S. S. Woody, on vaccation.

Changes at Polyclinic Hospital.—At the last meeting of the board of managers, Dr. Thomas B. Holloway was elected professor of ophthalmology to succeed Dr. James Thorington, resigned; Dr. Charles R. Heed was elected associate professor of ophthalmology; Dr. George S. Crampton was made lecturer on refraction.

Raid on Doctored Drinks.—A determined crusade, supported by the Phipps Institute, where several children are seriously ill from saccharine poisoning, and the child federation, resulted in the arrest, August 13, of twenty-eight persons in the downtown section of the city. Fourteen of them admitted their guilt and were fined $28 to $32 by Magistrate Rooney. Seven cases were continued and seven other violators of the pure food law paid the costs and signed the agreements to quit the business.

Crusade Against Rats.—As several deaths from bubonic plague have occurred in Liverpool, precautions are being taken at this port to prevent an introduction of the disease. Dr. Fairfax Erwin, in charge of the United States Marine Hospital here and Dr. Henry D. Heller of the State Quarantine Board, asked the cooperation of the Health Department to begin a war on rats which infest the river front. Following a conference of Chairman Connelly of councils finance committee and City Controller Walton, August 14, it was announced that $10,000 would be placed at the disposal of Director Harte of the Bureau of Health and Charities for this purpose.

TENNESSEE

New Officers.—Sullivan, Carter and Johnson Counties Medical Society, organized at Johnson City, July 23: president, Dr. Edward S. King, Bluff City, Sullivan County; vice-presidents, Drs. Edwin E. Hunter, Elizabethton, and David R. Butler; secretary, Dr. Conley M. Cowan, Bristol. The next meeting will be held at Bluntville.——State Association of Colored Physicians at Dickson: president, Dr. F. A. Stewart, Nashville; secretary, Dr. Isham H. Hampton, Fayetteville. The next meeting will be held in Nashville.

Personal.—Dr. William D. Haggard, Nashville, returned from Europe on the *Mauretania*.——Dr. Reynold M. Kirby-Smith, Sewanee, has been selected by the American National Red Cross to direct the relief work in one of the belligerent countries of Europe.——Dr. Walter Stewart, Bolivar, has been appointed superintendent for the West Tennessee Hospital for the Insane, succeeding Dr. James J. Neely, resigned. Dr. Edwin W. Cocke, Whiteville, has been appointed assistant superintendent.——Drs. John S. B. Woolford and Henry Berlin, Chattanooga, have been detained in London on account of war conditions.——Dr. James W. Gillespie, for fourteen years coroner of Hamilton County, has resigned and Dr. John J. Gee has been elected his successor.——Dr. Otis M. Hayward, proprietor and president of the Chattanooga Hospital, has accepted the presidency of the Hurlbut Sanitarium and Industrial School, Reeves, Ga.——Dr. Z. D. Massey, physician at the State Prison, has resigned and will resume practice at his old home in Sevierville.

TEXAS

New Officers.—Dallas Medical and Surgical Society, July 25: president, Dr. Oscar M. Marchman; secretary, Dr. Franklin A. Pierce.

Fund for Medical College.—A fund of $40,000 was subscribed for the medical department of the Texas Christian University, Fort Worth, July 23.

Dinner to Surgeon General.—In honor of Surgeon General Rupert Blue, U.S.P.H.S., the Sisters of the Incarnate Word, Galveston, gave a dinner July 13.

Tuberculous Convicts Pardoned.—Thirty convicts in the Texas State Penitentiary in an advanced stage of tuberculosis, have been pardoned by the governor.

Emergency Hospital Provided.—The United States Quarantine Station, Pelican Island, is being fitted up as a possible Emergency Hospital for contagious diseases with especial reference to bubonic plague.

Dr. Osborne not Dead.—Dr. Frank Ely Osborne, McAllen, Texas, states that the notice of his death which appeared in THE JOURNAL of August 15, is incorrect; that another person of the same name was in the automobile accident.

Work on Epileptic Colony to Begin.—Plans for the first of the two new buildings for the Epileptic Colony which will be established south of Abilene, have been received and construction work has been commenced. The buildings are to be two stories and basement in height and will be located on the southwest corner of the colony grounds.

Sanitarium News.—An addition to the Texas Baptist Memorial Sanatarium, Dallas, has been erected at a cost of $30,000. The building is to be used for negroes, Mexicans and indigent white patients.——The sanitarium at Sutherland Springs which is being erected at a cost of $10,000 is almost completed.——A cottage for consumptives has been erected at the North Texas Hospital for the Insane, Terrell.——Plans are being prepared for an addition to the St. Paul Sanitarium, Dallas.

Personal.—Drs. Hugh W. Crouse, El Paso and Robert S. Killough, Amarillo, have been detained in Germany on account of the war.——Dr. Henry A. Barr, Beaumont, has returned from abroad.——Dr. Bacon Saunders, Chief Surgeon of the Trinity and Brazos Valley Railway and Dr. Roy Saunders, Assistant Chief Surgeon, Ft. Worth, have resigned. Dr. A. Philo Howard, Houston, has been appointed Chief Surgeon for the Road.——Dr. Thomas J. Milner, Greenville, has been appointed medical director with the rank of Major in the Third Brigade Texas Division, United Confederate Veterans.——Dr. Paul Renger has resigned as health officer of Hallettsville to accept the position of health officer of Lavaca County.——Dr. Charles H. Brownlee, Austin, has resigned as field director of the Texas Hookworm Commission and will reenter practice at his old home in Burnett.

GENERAL

Hospital Experts to Meet.—The annual conference of the American Hospital Association will be held in St. Paul, August 25-28, with headquarters at the Hotel St. Paul.

Electro-Therapeutists to Meet.—The annual meeting of the American Electro-Therapeutic Association will be held in Battle Creek, Mich., September 15 to 17, under the presidency of Dr. George E. Pfahler, Philadelphia.

Anesthetists Elect Officers.—At the annual meeting of the American Association of Anesthetists held in Atlantic City recently, the following officers were elected: Dr. Charles K. Teter, Cleveland, president, and Drs. Mary V. Madigan, Portland, Ore., W. D. Galch, Indianapolis, and T. B. Buchanan, New York City, vice-presidents.

Fraternal Order's Work Against Tuberculosis.—The Loyal Order of Moose at its convention in Milwaukee, which closed July 31, decided to withdraw the appropriation of $125,000 which had been given annually to the official publication, "The Call of the Moose," and to use the money for the establishment and maintenance of a sanatorium for its members suffering from tuberculosis.

Retired Naval Surgeons Abroad.—The following retired officers of the medical corps of the United States Navy are reported to be abroad: Med. Dir. John C. Wise at Bordeaux, Surgeon General William K. Van Ruypen, Med. Dirs. Henry G. Beyer, Dwight Dickman, David Kindleberger and Averly C. H. Russell, Passed Assistant Surgeon Paul E. McDonnold and Assistant Surgeon Arthur C. Stanley, in London.

Bequests and Donations.—The following bequests and donations have recently been reported:

Methodist Hospital, Philadelphia, $5,000 by the will of Miss Hessy R. Miller for the maintenance of a free bed.

The Philadelphia Home for Incurables, $15,000 by the will of Mary J. Van Syckel, for the maintenance of two free beds.

German and St. Mary's Hospital, Philadelphia, an equal donation of the property owned by the late Mrs. L. Gluck at Twenty-fourth and Starley Streets.

Post-Graduate Hospital, New York City, $5,000 by the will of Miss Cora V. C. Catlin in memory of her brother John M. Catlin.

Dr. Gerald R. Maloney, Belleplaine, Minn., property valued at $400,000 by the will of Monsignor Thomas Kennedy.

Old Peoples' Home, Omaha, Neb., a donation of $5,000 toward an endowment fund in memory of Mrs. Ida V. Tilden, Oswego, N. Y., City Hospital, $10,000; New York Association for Improving the Condition of the Poor and St. Luke's Hospital, New York City, each $25,000 by the will of George E. Sloan of Oswego.

American National Red Cross, Colorado Chapter, donation of $1,000 by Lawrence C. Phipps, Denver.

The Plague Situation.—The last case of human plague reported from New Orleans was that of Rosie Southern, reported July 22 and officially diagnosed July 26. Four more cases of plague have been diagnosed since that time and the particulars of these are given below, together with the cases of rodent plague and the details of the work which is being so actively conducted in New Orleans by Assistant Surgeon-General William Colby Rucker, U.S.P.H.S., and his efficient staff with the intelligent and active cooperation of the health authorities of the state of Louisiana and the city of New Orleans. Case No. 14, Henry Chase, male, colored, 22, residing 2136 Eighth Street, car cleaner, working in the L. & N. shops, Girod and Front streets. Sickened July 29, 1914. Right femoral bubo. Officially declared plague Aug. 2, 1914. Case No. 15, Mrs. J. Bua, female, white, 20, residing 1836 Iberville Street, and working at the same address in a grocery. Sickened Aug. 11, 1914. Left femoral bubo. Officially declared plague Aug. 12, 1914. Case No. 16, Anthony Gergurovich, white, male, residence 1817 Carondelet Walk, employed at French market, sickened August 8, left inguinal bubo, diagnosis confirmed August 13. Case No. 17, Herman Schulz, white, male, age 17, residence 1836 Iberville Street, employed at same address, sickened August 1, diagnosis confirmed August 13, right femoral bubo. Cases 15 to 54 of rodent plague have been reported up to August 15. The infected rats were found in the same general localities as heretofore. From the beginning of the work on July 9, 1914, up to and including Aug. 12, 1914, there were captured in traps 42,214 rats, and in the same period a conservative estimate of the number of rats destroyed by the antiplague workers is 60,000. The campaign of publicity and education has been carried forward very vigorously. Three and four public addresses have been made each day, many of them illustrated by means of stereopticon views. As a result, there has been formed an organization in each of the seventeen wards of the city, each of which has established a precinct captain, under whom are monitors for each block. The commissioner of public property, the Honorable E. E. Lafaye, with Assistant Surgeon-General W. C. Rucker, has formed committees for the conduct of clean-up days in the various wards. Several wards have already been treated, and the work will be extended throughout the entire city. Public cooperation has been very extensive, and thousands of yards of concrete and other rat-proofing material are being laid throughout the city, and the city is rapidly becoming more sanitary. Advantage has been taken of the billboards of the city to extend the publicity campaign. There is one large night and day sign 30 feet long by 12 feet high located on Canal Street, and there are distributed throughout the city 400 posters, 42 inches by 84 inches, calling on the citizens to unite in the sanitary campaign. The inspection of outgoing freight has been extended, and there are now employed in this work one chief inspector and eighty-two assistant inspectors. The citizens' committee, which was appointed by Mayor Behrman, was reorganized on August 6 as the Citizens' Health Committee, with Mr. Crawford Ellis as chairman. This committee consists of the original fifteen members appointed by the mayor and seventeen members representing the various wards of the city; a special committee on sanitation, of which Dr. H. Dickson Bruns is chairman; a committee from the New Orleans Parish Medical Society, of which Dr. Jos. Scott is chairman; a committee from the Pan-American Medical Society, of which Dr. Hochfeldt is chairman; the state health officer, the city health officer and the officer in command of the United States Public Health Service are also members of this committee. The committee meets each Thursday for the purpose of considering cooperative work of the campaign. It is anticipated that the women's clubs of the city will be given a representative on the Citizens' Health Committee. During the fortnight ended August 8, 219 vessels were fumigated; 21,827 pounds of sulphur were burned; 172,917 tons of outgoing freight were inspected; 45 clean bills of health and 10 foul bills of health were issued. The overland freight inspection during the same period included 9,888 cars; the rat-proofing of 3,272 cars; the condemnation of 18 cars and the killing of 13 rodents in cars. In the field operations 19,405 rats were trapped, 227 dead were inspected; 18 buildings were fumigated; 33,910 poisons were placed, and 3,926 buildings were inspected. In the laboratory 18,670 rats were examined out

of 20,752 received; of these 61 were suspicious and the diagnosis of plague was confirmed in 29. The following circular letter regarding shipment of merchandise was issued August 4:

To Shippers, Agents and Others Concerned, City of New Orleans, La.

For your guidance, and in order to prevent unnecessary hindrance to commerce, you are informed that, in compliance with United States Statutes At Large, Vol. 27, page 449, Act of February 15, 1893, no merchandise shall be permitted shipment from New Orleans, except it be so protected as to exclude rats.

This applies especially to merchandise in crates, barrels, hampers or boxes, and packed with excelsior, straw, paper or burlap.

Containers must be so closed at the time of packing as to effectually exclude rodents, and to this end the Service inspectors stationed at the various railroad freight terminals have been instructed to prohibit the loading of any freight not conforming to the above requirements.

W. C. Rucker, Assistant Surgeon General, Commanding.

FOREIGN

Hospital Ship Commandeered.—The British Steamer *Protesilaus* which stopped at Victoria, August 5, on the way from China to Seattle, was boarded by British officers who took command, and ordered her to discharge her cargo of silk. She was then taken to the Esquimault navy yard where she will be equipped as a hospital ship.

Medical Regulations in Korea.—The American consul general at Seoul has forwarded to the Bureau of Foreign and Domestic Commerce, Washington, a translated copy of the recent orders of the government of Chosen for the control of physicians, dentists, Korean old-style physicians and supernumerary medical advisers or public health officers. These regulations became effective the first of the year.

Medal for Oswaldo Cruz.—The last *Brazil Medico* gives an illustration of the square plaque with a bas-relief bust of Cruz and an allegorical figure on the reverse which was recently presented to him with much ceremony in the name of the Seventh Brazilian Medical and Surgical Congress. To Oswaldo Cruz belongs the honor of the sanitation of Rio de Janeiro which has eradicated yellow fever and transformed its public health record in general; also the more recent sanitation of Para in the rubber district. He has also stamped out plague wherever it has obtained a foothold in Brazil in late years.

Offer to Establish Hospitals.—Mrs. Sarah Wilson and Mrs. George Keppel have offered to establish a French-English hospital at LeTouquetor whenever the French government deems it advisable. The hospital will contain 2,000 beds and will be maintained as long as the war lasts. ——The American Ambulance Corps in Paris has secured a building in Neuilly which is to be transformed into a hospital. Twelve American physicians headed by Dr. Joseph A. Blake, New York City, and twenty-four nurses, have volunteered for service and $9,000 has already been subscribed for the maintenance fund.

Student Congress in Latin America.—The fourth international biennial Pan-American congress of university students is to be held at Santiago in September. The third meeting was at Lima in 1912. There are eleven subjects appointed for discussion at the approaching congress, including suggestions for reforms in the curriculum and methods; higher education of women; the problem of sexual relations from the point of view of the student; comparison of conditions in regard to sanitation and hygiene in the various countries of America, and conditions in regard to professional and industrial life as affecting choice of a career. Rafael Capurro of Lima, Peru, is one of the secretaries of the Oficina Internacional Universitaria Americana.

CANADA

Indemnity Claims.—The late typhoid fever epidemic in Ottawa, Ont., resulted in the preferring of 2,500 claims for indemnity against the Ottawa city council. Of these 681, representing an amount of nearly $35,000, have been passed for payment.

New Officers.—Alberta Medical Association ninth annual meeting at Medicine Hat July 16 and 17: president, Dr. Robert G. Brett, Banff, secretary, Dr. F. C. Clarke, Calgary. ——Vancouver, B. C., Medical Society: president, Dr. William D. Keith, secretary, Dr. J. H. MacDermot.

Dominion Physicians Meet.—The Canadian Medical Association held its annual meeting in St. John, N. B., in July. The next annual meeting will be held in 1915 in Vancouver, B. C., with Dr. R. E. McKechnie, Vancouver, as president. Dr. William W. Francis, Montreal, was re-elected secretary.

New Legislators.—In the recent Manitoba elections the following members of the medical profession were elected to the legislature of that province: Drs. Robert S. Thornton, Deloraine; Dr. McFarden, Emerson; Hon. Dr. W. H. Montague, Minnedosa; and Drs. Armstrong and George Clingan, Virden.

Canadian Physicians Abroad.—Word has been received from Dr. J. George Adami of McGill University that he is at present in Switzerland but will return to London as soon as possible.——When last heard from President Falconer of the University of Toronto was in Sweden.——Mr. Irving Heward Cameron, professor of surgery in the University of Toronto, is in London, England, and expects to return to Toronto in September.

Offer Services for War.—Drs. D. A. McLennahan, Hamilton, David B. Bentley, Sarnia, and Robert E. Wodehouse, Fort William, district officers of health in Ontario, have signified their intention of relinquishing their public health duties and going abroad with Canada's first contingent to the European war.——Dr. John A. Amyot, provincial bacteriologist and professor of public health in the University of Toronto, has offered his services to the federal government for like service.

Personals.—Dr. Samuel J. Streight, Welland, Ontario, has gone abroad for a year.——Drs. Alan G. Brown and J. George A. Campbell have been appointed directors of Child Hygiene, Department of Public Health, Toronto.——Dr. Herbert E. Clutterbuck, Toronto, is doing graduate work in Edinburgh. ——Dr. W. Ewart Ferguson, associate editor of *The Canada Lancet*, Toronto, has sailed for Europe.——Dr. David Jamieson, Durham, member for South Grey in the Ontario Legislature is to be the next speaker of that body.

LONDON LETTER

London, July 31, 1914.

THE CLINICAL CONGRESS OF THE SURGEONS OF NORTH AMERICA

(Continued from page 592)

Annual Executive Session

At the annual executive session Dr. Davidson of Illinois presented a report on the standardization of surgery. He said that this should take place on the lines of education and legal enactment modifying and amending the various practice acts in the different states. Dr. Jeff. Miller, New Orleans, presented a report from the committee on cancer. Dr. A B. Kanavel, Chicago, presented a report on the standardization of hospitals. He said that the replies obtained in answer to a circular from the various hospitals, especially the large hospitals, showed that the project was received with favor. Work should be done by cooperation of the American Medical Association, the American Hospital Association, the Carnegie foundation and various medical educational bodies. The measures proposed were (1) an end-results card catalog, (2) a follow-up system, and (3) an efficiency committee composed of members of all branches of hospital management. A hospital which refused to admit and record its failures and to analyze the reasons for the failure to give relief was not doing its duty. The following officers were elected: president, Charles H. Mayo, Rochester, Minn.; first vice-president, Herbert Bruce, Toronto; second vice-president, R. L. Dickinson, Brooklyn; secretary, F. H. Martin, Chicago; treasurer, A. B. Kanavel, Chicago; general manager, Albert Ballou.

Suture of Levator Ani in Perineorrhaphy

Dr. Henry Jellett, Dublin, opened a discussion on this subject. He pointed out that the levator ani was an essential constituent in the pelvic floor, but none of the older methods provided a means for its suture and many of the present generation of gynecologists continued to practice them because they thought suture of the muscle was difficult and not devoid of danger. Certain writers had introduced unnecessary complications into an operation which was really very simple. The essential features of the operation were as follows: (1) The careful dissection of the necessary amount of vaginal mucous membrane off of the rectum; (2) the exposure and suture of the separated levator ani muscles, and (3) the careful approximation of the cut edges of the vaginal mucous membrane so as to leave no projection or redundancy. The operation was carried out as follows: The extent of the

perineal tear was carefully determined, and its anterior edges were marked out by bullet forceps. A third bullet forceps was applied to the perineal skin just behind the posterior edge of the tear. The position of the separated edges of the levator ani was palpated through the mucous membrane of the vagina. An incision was then made from side to side along the line of junction of the skin and the vaginal mucous membrane. This incision cut through the skin and any underlying scar tissue. A flap of vaginal wall was then dissected up off the underlying rectum. At its lowest part it was firmly held to the rectum and the sphincter ani by cicatricial bands, the result of the healing. As soon as these had been cut through, the separation of the remainder of the flap by blunt dissection was easy. When the dissection of the flap was complete a triangular space was exposed, which was bounded laterally below by the remains of the superficial vaginal and perineal muscles, and at a deeper level by the pubococcygeal fibers of the levator ani muscle, while its floor was formed by the rectum. It was then easy to catch the edges of the levator with clip forceps or dissecting forceps, and to draw them downward and inward until they met in the middle line. If the separation and atrophy of the muscle were marked it might not be possible to draw the edges down sufficiently, but in the great majority of cases they could be brought into view. Three or four interrupted sutures of catgut were then passed through them from side to side, so that when tied they would approximate them in the middle line; for the present, however, they were left untied. The next step was to trim the vaginal flap into proper shape, so that when the operation was complete there might be no redundancy. The cut edges of the flap were then brought together by a continuous catgut suture passed from above downward, and ending at the vulvar orifice. This being done, the catgut sutures in the levator muscle might be tied. The last step consisted in the introduction of silkworm-gut sutures passed so as to close the skin edges of the perineal wound. These sutures were passed from side to side, and traverse the skin and the remains of the superficial perineal muscles, and also the levator muscle so as to supplement the buried sutures.

Transplantation of Ovaries

Professor Tuffier, Paris, read a paper on this subject. The grafting of ovaries from one patient into another was difficult, but might become successful with the improvement of technic, and possibly some chemical substance might be found to protect the implanted ovary from the action of the phagocytes. He described the procedure of grafting the patient's own ovaries into the subperitoneal fatty tissue, the uterus being left *in situ*. The graft could be made in the neighborhood of the uterus or elsewhere. The abdomen was opened, adhesions broken down; the ovary, tubes and glands were isolated; the ovary was then dissected out and embedded in a pouch formed in the subperitoneal fat. The fallopian tubes were then removed. Complete hemostasis was important and asepsis was necessary; otherwise the grafts became cystic or sclerosed. If necessary, the gland could be divided into two parts and each portion engrafted. The implanted ovaries remained inactive for about three or four months after operation, and symptoms of climacteric commenced; then for four or five days the ovary became painful and menstruation recommenced. There was usually a period of six months between the operation and the establishment of menstruation.

(To be continued)

Marriages

GEORGE REED TABOR, M.D., Crystal Springs, Tex., to Mrs. Augusta Jones Hunting of Houston, Tex., at Birchmont, North Conway, N. H., July 29.

EDWARD N. BRUSH, M.D., Towson, Md., to Miss Marie Tregoe Hartman of Forest Park, Md., August 6.

ALBERT CLIFFORD HIRSCHFIELD, M.D., Norman, Okla., to Miss Florence Kynette of Dallas, Tex., July 5.

VICTOR ERRILL BELLINGER, M.D., Mt. Pleasant, Iowa, to Miss Regina Kelley, at Des Moines, Iowa, July 26.

EDWARD KENT ARMSTRONG, M.D., Chicago, to Miss Caroline Holmes Focer of Cape May, N. J., August 10.

ALICE JOSEPHINE B. HOPKINS, M.D., and Mr. Clarence Carl Tolg, both of Madison, Wis., June 6.

Deaths

Alfred Mercer, M.D. Geneva, N. Y., Medical College, 1845; a Fellow of the American Medical Association; dean of the medical profession of central New York; professor of minor and clinical surgery, and later professor of state medicine and emeritus professor of medicine in Syracuse University College of Medicine; once president of the Syracuse Medical Society, Onondaga County Medical Society and Syracuse Academy of Medicine, vice-president of the Medical Society of the State of New York and treasurer of the Medical Society of Central New York; a member of the British Medical Association and American Public Health Association; a member of the State Board of Health for five years and of the Syracuse Board of Health for seven years; than whom no medical practitioner in the state was held in greater respect and love; died at his home in Syracuse, August 5, aged 93.

William Henry Carr, M.D. University of Pennsylvania, Philadelphia, 1883; a Fellow of the American Medical Association; a specialist in diseases of the eye, ear, nose and throat; for two years resident physician at the Schuylkill County Hospital; died at his home in Lancaster, Pa., August 2, from injuries sustained in a fall some time before.

Victor Clay Barringer Means, M.D. New York University, New York City, 1882; retired Lieutenant Commander, U. S. N.; a Fellow of the American Medical Association; since his retirement, in 1908, a resident of Philadelphia; died in the U. S. Naval Hospital, Washington, D. C., July 18, aged 54.

Phillip F. Dillon, M.D. Minnesota Hospital Medical College, Minneapolis, 1886; a member of the Rhode Island Medical Society; for sixteen years surgeon to the Soldiers' Home, Bristol, R. I.; a veteran of the Civil War; died at the home of his sister in Anacortes, Wash., July 31, aged 72.

Matthew Joseph O'Connell, M.D. Niagara University, Buffalo, N. Y., 1890; a Fellow of the American Medical Association and superintendent of an institution for the treatment of liquor and drug addiction in Buffalo; died in the institution, August 4, from acute gastritis, aged 52.

Walton Bolgiano, M.D. University of Pennsylvania, Philadelphia, 1892; a Fellow of the American Medical Association; for several years a member of the staff of the Presbyterian Hospital, Philadelphia; died at his home in Baltimore, August 2, from heart disease, aged 46.

Isaac W. Hazelett, M.D. Jefferson Medical College, Philadelphia, 1879; a specialist on diseases of the eye, ear, nose and throat; local surgeon of the Santa Fe System at San Bernardino, Cal.; died in the Pacific Hospital, Los Angeles, August 4, from pneumonia, aged 58.

William I. Wood, M.D. University of Worcester, Cleveland, Ohio, 1888; for ten years a practitioner of Massillon, Ohio, but for a month a resident of Seville, Ohio; died in the German Hospital, Cleveland, August 8, after an operation for appendicitis, aged 56.

Michael W. Raub, M.D. Jefferson Medical College, 1865; a member of the Medical Society of the State of Pennsylvania and a noted ornithologist; curator of Franklin and Marshall College, Lancaster, Pa.; died at his home in Lancaster, August 8, aged 78.

Dryden Hemingway Lamb, M.D. University of Michigan, Ann Arbor, 1891; a Fellow of the American Medical Association and a specialist on diseases of the eye, ear, nose and throat; of Owosso, Mich.; died at his home in that city, about August 5.

Edmond M. Cahen, M.D. University of Southern California, Los Angeles, 1908; a Fellow of the American Medical Association; of Los Angeles; died in that city August 4, it is believed by suicide while despondent over business affairs, aged 29.

Phaon D. Keiser (license, Carbon County, Pa., 1881), for fifty-three years a practitioner of Carbon County; a member of the Medical Society of the State of Pennsylvania; died at his home near Lehighton, Pa., July 31, aged 76.

William Henry Eldred, M.D. Rush Medical College, 1882; Hahnemann Medical College, Chicago, 1883; died at his home in Chicago, August 12, aged 56.

Glenn Orville Hymer, M.D. Marquette University, Milwaukee, Wis., 1910, of Williston, N. Dak.; died in Madison, Minn., July 23, aged 28.

Charles Heselton Foster, M.D. Dartmouth Medical School, Hanover, N. H., 1875; for more than thirty years a practitioner of Lisbon, Maine; died at his home in Riverside, Cal., August 2, from pneumonia.

Cleveland Stuart Stilwell, M.D. College of Physicians and Surgeons in the City of New York, 1875; a director of the Peconic Bank and a retired practitioner of Sag Harbor, L. I., N. Y.; was found dead at his home August 6, from asthma, aged 61.

Daniel McD. Yount (license, North Carolina), a practitioner for fifty-five years; a Confederate veteran; twice a representative in the legislature from Catawba County; died suddenly at his home in Conover, N. C., August 8, aged 81.

Elmer Ellsworth Finch, M.D. Albany, N. Y., Medical College, 1886; a member of the Medical Society of the State of New York; died at his home in Schodack Center, N. Y., July 18, aged 48.

John Albin Hamilton (license, Washington, 1900) of Seattle; a practitioner since 1897; died recently from septicemia following an accidental gunshot received while hunting in Alaska.

William F. Richardson, M.D. American Medical College, Eclectic, St. Louis, 1871; of Pierce City, Mo.; died in Carthage, Mo., August 5, from pulmonary hemorrhage, aged 75.

Henry Hersey Mothersbough, M.D. University of Pennsylvania, Philadelphia, 1879; formerly of Beech Creek, Pa.; died at his home in Altoona, Pa., August 1, from nephritis, aged 70.

Lafayette Coffman, M.D. Maryland Medical College, Baltimore, 1905; a member of the Oklahoma State Medical Association; died at his home in Peggs, Okla., August 3, aged 44.

Albert Roderick Warren, M.D. Eclectic Medical Institute, Cincinnati, 1882; mayor of Pekin, Ill., in 1887; a veteran of the Civil War; died at his home in Pekin, August 5, aged 74.

Charles Henry White, M.D. Harvard Medical School, Boston, 1862; rear admiral U. S. Navy (retired); died at his home in Center Sandwich, N. H., July 26, aged 76.

J. H. Dick (license, Kansas, 1901), a practitioner of Lawrence, Kans., for nearly forty years; died at his home August 6, from cerebral hemorrhage, aged 84.

Amable Aurez Laferriere, M.D. Ecole de Medicine et de Chirurgie, Montreal, 1868; died at his home in New Carlisle, Que., April 28, from arteriosclerosis, aged 67.

Bror Otto Ericson, M.D. Jefferson Medical College, Philadelphia, 1897; died at his home in Cassopolis, Mich., July 7, from inflammatory rheumatism, aged 48.

Dennis Francis O'Callaghan, M.D. Harvard Medical School, Boston, 1887; died at his home in Dorchester, Boston, July 29, from septicemia, aged 50.

Walter Frederick Appleton, M.D. New York Homeopathic Medical College, 1906; of Passaic, N. J.; died in White Haven, Pa., August 2, aged 35.

Frank Jones, M.D. University of Buffalo, N. Y., 1903; of Niagara Falls, N.Y.; died in Memorial Hospital, Niagara Falls, August 4, aged 38.

Albert Southworth, M.D. Homeopathic Hospital College, Cleveland, Ohio, 1869; died at his home in Los Angeles, recently, from dysentery.

Thomas J. Smith, M.D. Cincinnati College of Medicine and Surgery, 1869; died at his home in Coshocton, Ohio, July 23, from gastritis, aged 67.

Charles H. Laas, M.D. University of Louisville, Ky., 1890; died at his home in Burton, Texas, August 4, from congestion of the brain, aged 49.

Solomon L. Reefy, M.D. Eclectic Medical Institute, Cincinnati, 1870; died at his home in Edinburg, Ill., August 2, from paralysis, aged 75.

Robert R. Church, M.D. University of Pennsylvania, Philadelphia, 1870; died at his home in Wormleysburg, Pa., July 30, aged 69.

Henry Marsh Haskell, M.D. Bellevue Hospital Medical College, 1878; died recently at his home in Redlands, Cal., aged 62.

William Wilford McMurdo, M.D. Washington University, St. Louis, 1905; died at his home in Marissa, Ill., August 6, aged 35.

Jerome E. Butler, M.D. University of Louisville, Ky., 1854; died at his home in Aspen Hill, Tenn., July 24, aged 83.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

ARTICLES ON SOCIALIZATION OF MEDICINE

To the Editor:—I am preparing a paper for the society on the "Socialization of Medicine." Please tell me where I can find something on the subject of medical work by contract or under state law in England, Germany, France or other countries, ancient or modern, where the state has taken a hand in such work. P. R. H., M.D., Nebraska.

ANSWER.—The following is a list of articles on this subject:

A State Medical Service, London Letter, THE JOURNAL, Jan. 31, 1914, p. 391.
Socialization of Medicine in England, Medical Economics, THE JOURNAL, Jan. 24, 1914, p. 316.
Warbasse, J. P.: Socialization of Medicine, THE JOURNAL, July 18, 1914, p. 264.
The Insurance Conflict, Berlin Letter, THE JOURNAL, Feb. 14, 1914, p. 549.
Benefits of the British Insurance Act, Medical Economics, THE JOURNAL, July 26, 1913, p. 296.
A New Form of Insurance in England, Medical Economics, THE JOURNAL, Jan. 23, 1909, p. 326.
Medical Men: Their Place and Influence in the State, *Brit. Med. Jour.*, Feb. 14, 1914.
Industrial Insurance in Germany, Medical Economics, THE JOURNAL, March 28, 1914, p. 1039.
Industrial Struggles of Physicians Abroad, Medical Economics, THE JOURNAL, Jan. 31, 1914, p. 398.
The Place of Medical Men in the Modern State, Medical Economics, THE JOURNAL, April 4, 1914, p. 1112.
Medical Remuneration under the Insurance Act, London Letter, THE JOURNAL, March 21, 1914, p. 945.
Mr. Lloyd-George on the Insurance Act, London Letter, THE JOURNAL, March 7, 1914, p. 789.
Carroll, J. B.: Workmen's Compensation Law and the Physician, *Boston Med. and Surg. Jour.*, Jan. 1, 1914.
French, J. R.: Medical Situation of New Workmen's Compensation Act, *California State Jour. Med.*, April, 1914.
Oliver, T.: Medico-Social Problems from an Insurance Point of View, *Lancet*, London, April 4, 1914.
The National Insurance Act and Scarcity of Physicians, London Letter, THE JOURNAL, Jan. 17, 1914, p. 218.
Rogers, B. M. H.: Experiences of Medical Adviser Under Insurance Act, *Brit. Med. Jour.*, June 28, 1913.
Rowntree, C.: Workmen's Compensation Act and Physician, *Practitioner*, London, August, 1913.
Merrick, R. M.: Workmen's Compensation Act as it Affects Physicians, *Boston Med. and Surg. Jour.*, Sept. 18, 1913.
The Crisis in Germany, Current Comment, THE JOURNAL, Dec. 13, 1913, p. 2163.
Medical Insurance Abroad, Medical Economics, THE JOURNAL, Dec. 27, 1913, p. 2314.

EFFECT OF LOSING TEMPORARY TEETH

To the Editor:—A patient of mine, a child of 4 years, has had the two upper central incisors knocked out. What, if any, is likely to be the effect on the growth of the jaw, and room for the other (permanent) teeth? The teeth were in perfect alignment before the accident.
WILLIAM H. GOODSON, M.D., Liberty, Mo.

ANSWER.—The accidental removal of the temporary teeth at the age of 4 should have no influence on the growth of the jaw, or on the development of the permanent teeth.

SOURCE OF ARMY ANTITYPHOID VACCINE

To the Editor:—Can you tell me what vaccine (from what laboratory) is used for antityphoid vaccination in the United States Army?
DR. RODGER-CHENOWETH, Escanaba, Mich.

ANSWER.—These vaccines are prepared in the laboratory of the Army Medical School at Washington, D. C. Vaccine from the same source is furnished for the navy and the organized militia as well as other departments of the government service, which call on the army laboratory for it.

BECK'S PASTE

To the Editor:—1. What is the formula for Beck's paste?
2. Is it indicated in treating intestinal fistula?
3. How is it used? C. C. COLLINS, M.D., Roachdale, Ind.

ANSWER.—1. Two forms of paste are used: (*a*) Bismuth subnitrate 30 parts and petrolatum 60 parts; mix and stir while boiling. (*b*) Subnitrate of bismuth 30 parts, white wax, 5 parts, soft paraffin 5 parts and petrolatum 60 parts; mix while boiling. One per cent. of solution of formaldehyd may be added to these pastes.
2. No.

3. The paste is sterilized before using. It is sucked up into the syringe while still liquid and cooled to the requisite temperature by running cold water over the syringe. It is injected very slowly and the injection is continued until the sense of pressure annoys the patient. Then the syringe is laid aside and a bit of gauze is held for a time over the outlet of the fistula to keep the paste from running out and an ice-bag is put over the region to harden the injected material.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALBERTA: Edmonton, September 15. Registrar, Dr. Cecil E. Race, University of Alberta, Edmonton.

IOWA: Des Moines, September 10-12. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.

MISSOURI: Kansas City, September 28-30. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW YORK: September 22-25. Chief of Examination Division, Mr. Harlan H. Horner, Department of Education, Albany.

Nevada May Report

Dr. Simeon L. Lee, secretary of the Nevada State Board of Medical Examiners, reports the written examination held at Carson City, May 4-6, 1914. The number of subjects examined in was 13; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 7, of whom 4 passed, including 1 osteopath, and 3 failed. Seven candidates were licensed through reciprocity. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Kentucky School of Medicine	(1906)	77.2
Bellevue Hospital Medical College	(1888)	87.4
Royal University of Naples	(1903)	80.9

FAILED College	Year Grad.	
Kentucky School of Medicine	(1907)	*
University of Maryland	(1884)	†
Eclectic Medical Institute, Cincinnati	(1890)	*

* Papers thrown out because of fraud.
† License not granted because of mental condition.

LICENSED THROUGH RECIPROCITY College	Year Grad.	Reciprocity with
State University of Iowa, Coll. of Homeo. Med.	(1908)	Iowa
Tulane University of Louisiana	(1910)	Louisiana
Nebraska College of Medicine	(1907)	Utah
Jefferson Medical College	(1881)	Wisconsin; (1903) Wisconsin
University of Pennsylvania	(1900)	Pa.
Western Pennsylvania Medical College	(1895)	Pa.

New Mexico April Report

Dr. W. E. Kaser, secretary of the New Mexico State Board of Health and Medical Examiners, reports the written examination held at Santa Fe, April 13-14, 1914. The number of subjects examined in was 13; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 5, all of whom passed. Eight candidates were licensed on satisfactory credentials. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Hering Medical College	(1904)	85.9
American Medical College, St. Louis	(1913)	75
Grant University, Medical Department	(1904)	82.3
University of Tennessee	(1913)	80.2
Royal University of Padua	(1886)	79.8

LICENSED ON CREDENTIALS College	Year Grad.
Atlanta Medical College	(1897)
Rush Medical College	(1913)
College of Physicians and Surgeons, Keokuk	(1875)
Omaha University, Medical Department	(1902)
Columbia University, Coll. of Phys. and Surgs.	(1904)
Hahnemann Med. College and Hospital, Philadelphia	(1892)
University of Pittsburgh	(1911)
Vanderbilt University	(1893)

Book Notices

HEALTH THROUGH DIET. A Practical Guide to the Uric Acid Free Diet Founded on Eighteen Years' Personal Experience. By Kenneth G. Haig, L.R.C.P., M.R.C.S., with the Advice and Assistance of Alexander Haig, M.A., M.D. Cloth. Price, $1.25 net. Pp. 227. Philadelphia: J. B. Lippincott Company, 1914.

The importance of diet in securing and preserving health is not to be denied, and when we have a record of personal experience, the results deserve a patient hearing. The book comes to us with a certain handicap since we recognize that the author is thoroughly saturated with his father's peculiar ideas with reference to uric acid and its relation to disease. A glance at the contents soon shows that the term "Diet" is used in a special sense and means a "uric acid-free diet." The adoption of such a diet constitutes admission to a cult which has its stages from the first weaning from tea, coffee and soup, to the full renunciation in which every vestige of the hateful purins has been cast out. This cult uses ordinary terms with strange or exaggerated meanings. To talk of eggs, beans, peas, etc., as poisonous or as containing poison seems strange at first, but we soon learn that the essence of poisons is uric acid and everything which contains or can produce uric acid must at once be classed as poisonous among the initated, although common people have been consuming such substances for ages without showing any ill effects. Then again, plain chemical terms become perverted in meaning in the dialect of the Haigites. "Cane-sugar is a stimulant by virtue of its acidity" (p. 30). What this may mean we cannot divine, but we believe that chemists still teach that pure cane-sugar is a perfectly neutral substance. Perhaps it may in some forms of metabolism give rise to acid products, but we are not aware that this is an ordinary action, unless forming carbon dioxid be recognized as constituting acidity. Again, we are told that "bread on the whole is not a very satisfactory food because it is very acid" (p. 23). It would appear that those saved from the horrors of uric acid have become so sensitive that they revolt at sour bread and we are sorry that England will not furnish them bread sweet enough to eat. The author has a new standard of nutrition, gauging the nutritive value of foods by their content of protein. Thus sugar, starch and butter or other fat are devoid of nutritive properties since they contain no protein.

The distinctness of view of those converted to the new way of life is shown by the following: "The chief argument against cheese as a food is that it is indigestible; from the meat eater's point of view this is so, but it does not hold for those on the Uric Acid-Free diet" (p. 15). The reader will also be interested in the following: "Peanuts, which are botanically not nuts at all, but pulses, are poisonous." "Bread made with baking-powder is certainly to be preferred to that made with yeast, which is poisonous." Lest the House of Haig be overlooked we find at intervals of about ten pages the title, publisher and author of "Some Recipes for the Uric Acid-Free Diet," by G. M. Haig.

The difficulties of the author and of other Haigites in a purin-eating world are enough to excite our sympathy. When venturing into profane society the author tells us that he usually takes some sustenance before leaving home "and then when I get there I eat what I can and play about with the rest, hiding the poisonous things under the knife and fork. This of course is not pleasant, but the matter has got to be faced out." A sad predicament indeed! A waterproof pocket in the dinner-coat to hold the "poison" would surely be handy. The author makes some comforting statements in regard to the effect of the new way of living which we gladly quote. "My temper certainly has been improved by being on Uric Acid-Free Diet." "Another small point is, that since I have been on Diet I have not been bothered by the unwelcome attentions of the flea, the midge, the mosquito and others of the kind. . . . This is a common experience amongst those on the Uric Acid-Free Diet." "Getting out of bed in the morning has no terrors for me and I find

the morning the best time for work." Dr. Haig still believes in cooking. He looks forward to an ideal diet consisting of fruit and nuts which will need no cooking, but in the times of imperfection in which we find ourselves he cannot dispense with the culinary art. As a scientific treatise, this book is valueless. As a specimen of the literature of a self-satisfied sect or fad it will prove interesting to any one who will take the trouble to read it.

Modern Anesthetics. By J. Frederick Silk, M.D., Senior Anesthetist, King's College Hospital. Cloth. Price, $1 net. Pp. 200, with 37 illustrations. New York: Longmans, Green & Co., 1914.

As the author says the principal object of this book is to describe in detail those procedures which he has found most useful in his own practice. The anesthetics most commonly used are briefly described, after which the technic to be followed and the difficulties most likely to occur are discussed. The choice of anesthetic in the judgment of the author should be the subject of a consultation between the surgeon, the medical adviser and the anesthetist. He gives his own views as derived from experience, but not in such a way as to be of great assistance to one in doubt. Silk gives little information in reference to the newer anesthetics, and particularly with reference to the use of alkaloids his advice is very indefinite. He is evidently carefully conservative, not wishing to discredit anything that may be of service, but placing the emphasis on those methods which his experience has shown him to be of tried worth. In indicating the principles to follow in choosing the anesthetic, he points out that the nature of the operation should have weight in determining which agent to employ. He states that although there is a general impression that children bear anesthetics well, there is a considerable mortality from this cause and that the number of children who escape by a slight margin is still greater. The technic of administration is fully described and the difficulties and dangers thoroughly considered. The later chapters of the book discuss operations on special regions and the methods of spinal and local anesthesia and analgesia. The author cannot be said to be optimistic for local methods, although he admits that they are especially appropriate in the operations on the eye and the nasal mucous membrane. The anoci-association method of Crile is given in Crile's own words. The brief comments made on the method are favorable.

A Manual of Clinical Diagnosis by Means of Laboratory Methods for Students, Hospital Physicians and Practitioners. By Charles E. Simon, B.A., M.D., Professor of Clinical Pathology at the College of Physicians and Surgeons. Eighth Edition. Cloth. Price, $5 net. Pp. 809, with 210 illustrations. Philadelphia: Lea & Febiger, 1914.

In this edition, Simon has included, among other additions, a discussion of the important serodiagnostic tests of Abderhalden based on the appearance of the "protective ferments" in the blood-serum; the applicability of the complement-fixation test to latent gonorrheal infections, and the phenolsulphonephthalein test for renal activity. The subject-matter of the book is divided into two parts. The first is devoted to technical questions and the second to the application of laboratory findings to diagnosis. This is an excellent arrangement, as any one who has had experience with students in this subject will agree. The tests discussed throughout the work, are for the most part, very satisfactory and may be accepted as the best for the matter in hand. Folin's newer methods of studying the various nitrogen factors of the blood have been wisely included. It is noted that Simon prefers the Noguchi acetone-insoluble lipoid antigen for the Wassermann reaction, although he states that he is about to employ the cholesterinized alcoholic extracts in his work. The latter antigens are, in our opinion, the best at our disposal. No mention is made of Benedict's qualitative test for sugar in the urine, which test is probably the most satisfactory one for routine purposes. Further, we are able to find no reference to the formaldehyd-titration method for ammonia and amino-acids or to Lange's colloidal gold test of the cerebrospinal fluid. Both of these tests would seem to be of sufficient value to warrant inclusion. This work is to be recommended to all who may desire a thoroughly reliable and up-to-date treatise on clinical diagnosis. The discussions are clear and exact. The selections of methods are entirely adequate. The illustrations are good and the color plates especially worthy of mention.

The Principles and Practice of Gynecology. For Students and Practitioners. By E. C. Dudley, A.M., M.D., Professor of Gynecology, Northwestern University Medical School. Sixth Edition. Cloth. Price, $5 net. Pp. 795, with 463 illustrations. Philadelphia: Lea & Febiger, 1913.

There are few medical text-books in this country that for so many years have been regarded as standard as has this one of Dudley. In 1902 the present reviewer wrote, "Dudley's book has always been held in high esteem both by the specialist and by the general practitioner who is compelled to do a certain amount of gynecologic work, and this edition will, we are sure, make it still more popular." This was written twelve years ago in reviewing the third edition; it was then an old and well-known text-book. The popularity of Dudley's Gynecology rests, primarily, on the fact that the subject-matter is presented in a practical manner with sufficient elementary details to satisfy the general man, but not so much as to offend the specialist; and, secondarily, on the fact that the book is liberally and beautifully illustrated with what surely may be regarded as practical and useful illustrations. The sixth edition has been brought up to date in every particular. There is scarcely a chapter that does not bear evidence of revision. Many large illustrations have been added, making the book better than before in this regard at least. In a word, this book may be regarded as a standard text-book representing modern gynecology.

Development and Anatomy of the Nasal Accessory Sinuses in Man. Observations based on Two Hundred and Ninety Lateral Nasal Walls, Showing the Various Stages and Types of Development of the Accessory Sinus Areas from the Sixtieth Day of Fetal Life to Advanced Maturity. By Warren B. Davis, M.D., Assistant Demonstrator of Anatomy in the Daniel Baugh Institute of Anatomy, Philadelphia. Cloth. Price, $3.50 net. Pp. 172, with 57 illustrations. Philadelphia: W. B. Saunders Company, 1914.

This book is mechanically excellent. It contains fifty-seven slightly tinted accurate and very clear cuts illustrating the nasal accessory sinuses at all stages from embryonic to adult life. The legends explaining the various figures are satisfactory, so that anatomic features may be taken in quickly. The text is clear and concise, yet comprehensive, and all in all it is a valuable addition to the literature of the development and anatomy of the region specially interesting to the rhinologist.

Plain Rules for the Use of Tuberculin. By R. Allan Bennett, M.B., Physician in Charge of Devon County Council Tuberculosis Dispensary. Cloth. Price, $1 net. Pp. 48. New York: William Wood & Co., 1914.

This small book containing twenty pages of useful text gives plain and conservative directions as to the technic and indications for tuberculin treatment. It is by no means exhaustive, but it may be said to be reliable. The author opposes the system by which general reactions are allowed to occur, but thinks that for working people the plan of procedure that avoids all reactions consumes too much time. Hence he aims to graduate the doses so that while focal reactions may occur, the general reactions are avoided. In his estimate of the relative value of the methods, he puts the combination of sanatorium and tuberculin first, sanatorium alone second, and tuberculin third.

Black's Medical Dictionary. By John D. Comrie, M.A., B.Sc., M.D., Lecturer on History of Medicine, University of Edinburgh. Fifth Edition. Cloth. Price, $2.50. Pp. 858, with 353 illustrations. New York: The Macmillan Company, 1914.

This is an encyclopedic, one-volume dictionary intended for the use of lay persons who wish an explanation of medical terms and conditions in non-technical language. The text has been thoroughly revised and is well up-to-date. So far as a brief examination indicates, the work fulfils its purposes satisfactorily.

Miscellany

One Standard of Entry to the Practice of the Healing Art

The following statements, made by Dr. F. M. Crandall of New York a few years ago in regard to the various systems of drugless therapy, apply with equal force to-day. The followers of some of these "symptoms" are persistent in their efforts to lower educational standards or break down the requirements of medical practice acts in order that they can enter on the practice of the healing art without having to comply with the educational requirements or to present the qualifications which are deemed necessary for all other practitioners. There should be no special privileges granted to any "system." The people of every state have a right to insist that only properly qualified persons are given the legal right to treat human ailments.

"The most strenuous work of recent years has consisted of opposition to the demands of various systems of pseudomedicine. These systems are nothing more or less than levers and sledge hammers seized upon as the most effective means of breaking through the medical laws. And here we come upon a subject upon which there is much misapprehension. The medical laws are but a part of the general educational laws of the state. These laws are wide in their application, and cover many professions and diverse conditions. There is nothing exceptional in the laws covering medical practice. They are at the farthest possible remove from class legislation. They are simply a part of the great educational system of the state. The medical profession has upheld the hands of the state educational authorities, whose aim has been to enact a broad and consistent system of just and equitable laws. A state educational system has, therefore, been built up, of which the laws controlling medical practice are an integral part.

"POSITION OF THE MEDICAL PROFESSION

"The position of the medical profession is often misunderstood and their arguments have frequently been misjudged. The opposition of physicians to attempts to destroy the medical laws is often attributed to a spirit of trade unionism. This is controverted by the single fact that no attempt is made by the profession to curtail the practice of medicine by competent men. It is one of the fundamental principles that every man and woman exhibiting proper qualifications should be admitted to practice. Our opposition to pseudomedicine is, and should be, educational, not professional. We do not try to raise barriers against practitioners because they use a special system or adopt certain remedial measures. We do not oppose certain prevalent isms because of their methods of treatment, but because they are new and very clever manifestations of the old, old scheme to get within the medical fold without expending the time and money necessary to make a competent practitioner. The various systems of pseudomedicine are not pushed forward year after year with such determination because men so love this or that particular form of treatment, but because they offer the most promising means of evading the requirements of preliminary education, four expensive years in the medical college, a state examination, and then, perhaps, two years of unpaid service in a hospital. It is the educational question that is at the bottom of every one of these modern isms, and they are the more aggressive as the educational barriers are raised higher. It is upon educational, not professional grounds that we oppose them.

"TREAT ALL ALIKE; NO SPECIAL FAVORS

"The medical profession approves the system which requires the same general professional education of all its members. The specialist upon the eye and the specialist upon the throat, the physician and the surgeon, must each undergo the same training and must pass the same state examination. One may select any specialty he chooses and may adopt any method of treatment which his educated judgment dictates. He may use large doses or small, massage or electricity. What the state requires for one body of practitioners it should not abate in favor of another.

"AN ADEQUATE TRAINING REQUIRED

"We have one sound reason for opposing these systems which permit an abbreviated education, and one argument that no man can gainsay. We may properly demand that every man and woman who enters upon the practice of the healing art should have adequate education. Here we are on ground that cannot be misjudged or misrepresented. We ask no favors or special privileges. We are not the ones who are seeking to bring half-educated practitioners in by the back door. We simply ask equal requirements for all. Our position is, that those who seek to treat disease should go in through the same door, and a few should not be permitted to crawl in through holes and underground passages. We simply ask for an American square deal and equal rights for all."—*New York and Philadelphia Med. Jour.*, reprint *Jour. Med. Soc. New Jersey*, January, 1906, p. 247.

The Supposed Experimental Production of Hemolymph Nodes and Accessory Spleens

Owing to the conflicting evidence at hand concerning the production of accessory spleens and hemolymph glands *de novo* or from lymph-nodes, Arthur William Meyer (*Jour. Exper. Zool.*, 1914, xvi, 241) has made further experimental investigation of this important subject. It has been customary to classify the lymph-glands as hemolymph nodes and ordinary lymph-glands. Both types of glands or nodes have been supposed to occur in man, monkeys, rodents, domestic animals, birds and fishes. Those who attempted this study found that between these two types of lymph-nodes neither gross nor microscopic differentiation was possible. No definite characteristics could be assigned to either class, because the observer thought that all forms of transition existed. In spite of this acknowledged difficulty of differentiation, Levoe and Warthin formulated elaborate classifications, and men such as Tizzoni, Ethernod and others have described splenic nodules, on the peritoneum and on the great omentum, which they regarded as the result of physiologic compensation for the inactivity of the main spleen. On this supposition Tizzoni performed several splenectomies on dogs with the hope of proving his conclusion. He recorded no controls and gave no details regarding these dogs, such as their age, weight, or the size and position of the accessory spleens which he described. Foa and Luschka have already pointed out that the so-called accessory spleens are found also in the presence of a normal spleen. Of the thirty splenectomies which Mosler performed, the great omentum of only one dog was covered with dark-red nodules. Even granting that these were accessory spleens there is no proof that they were found as the result of splenectomy.

Meyer's experiments were carried out on dogs from two litters of five each. He performed splenectomies on eight, keeping one dog from each litter for a control. At the time of the operation they were examined for hemal nodes, and only one node was found with a reddened center in the gastrosplenic omentum. At the time of necropsy, from thirty to 126 days after operation, neither accessory spleen or hemolymph nodes were found, and all of the lymph-glands in the splenectomized dogs were normal, except in two dogs in which the bronchial lymph-nodes were intensely red. These nodes were injected and the afferent trunks were plainly visible up to the lung, which they entered, while the efferent trunks joined the larger mediastinal vessels near the jugulosubclavian junction. Furthermore, he examined seventy dogs and approximately one hundred cats, selected at random. Those nodes which were under suspicion were taken from the animals, examined microscopically and found to be normal lymph-nodes of the ordinary type.

Further experiments were made on five guinea-pigs of known weight. Guinea-Pig 1 was given injections of distilled water; Guinea-Pig 2 of oxalic acid, and Guinea-Pigs 3, 4 and 5 injections of diphtheria toxin. One hemolymph node was found in both 4 and 5; but since Retterer has shown that the reddish lymph-nodes occur in normal guinea-pigs, of all ages and under all conditions, Meyer is forced to conclude that the foregoing results are not necessarily due to his experiments. These reddened nodes were injected and found to maintain their previous connection with the lymphatic system.

It has long been known that changes in the lymph-nodes occur following various pathologic conditions, and that they

also remain unchanged and are not converted into another organ with a different function, losing their connection with the lymphatic system.

Investigation of animals subjected to bleeding has brought the same results. From these experiments Meyer concludes that the injection of toxins, bleeding or the removal of the spleen fails to produce any change of lymph-nodes into hemal nodes, thereby disproving Tizzoni's experiments which have been accepted for decades.

Some Mortality Statistics

The present population of the United States is not far from 100,000,000. The number of persons of both sexes, aged 70 and over, in 1910 was 2,270,021. According to the latest English life tables, out of every million born 277,351, or 27.7 per cent., may normally expect to reach the age of threescore and ten. In the United States the annual number of births is about 2,500,000, and the annual number of deaths is about 1,350,000. Of those who died during 1912, approximately 236,500, or 17.6 per cent., had lived less than one year, and 329,400, or 24.4 per cent., had lived less than five years.

The principal causes of death are as follows: first, tuberculosis, which affects every period of life and causes in the aggregate about 154,000 deaths; second, heart diseases, also affecting every period of life, but chiefly persons over 40, causing a mortality of about 150,000; third, nervous diseases, which account for about 138,000 deaths; fourth, pneumonia (all forms), about 132,000; fifth, intestinal diseases, about 123,000; and sixth, genito-urinary diseases, about 111,000. Following these six, in the order of importance, are accidents, causing about 182,000 deaths, and tumors, malignant and benign, about 75,000. These eight groups of cases combined account for about 72 per cent. of the aggregate mortality of the United States, which, as previously stated, is approximately 1,350,000 per annum. Other important causes are typhoid fever, the mortality from which is about 20,000 per annum; suicides, numbering approximately 16,000; deaths from parturition, about 15,000, and homicides, 6,000 to 7,000.

This may be considered the normal mortality of a civilized country not subject to exceptional or uncontrollable mortality conditions, such, for illustration, as continue to affect a great country like India even at the present time. The death-rate of the registration area of the United States during 1912 was only 13.9 per thousand, against a death-rate of 32 for British India. Of the 7,500,000 deaths, in round numbers, during the year 1911, 354,000 were caused by cholera, 58,000 by small-pox, 733,000 by plague, and 4,200,000 by fevers. Most of these causes are no longer an affliction of modern civilized countries, and they are fortunately brought slowly under control in the Indian Empire, where the death-rate has gradually been reduced from extraordinary proportions to a rate not much above the normal for the large cities of this country fifty years ago. The best illustration of India's marvelous sanitary progress is to be found in the reduction of the death-rate of the European army during recent years. Military discipline and conformity to sanitary rules and regulations, no doubt, largely account for this reduction, which has been of immeasurable benefit, not only to the European, but also to the native population.—The Chances of Death and the Ministry of Health, by Frederick S. Hoffman, Yale address.

Hints to Authors

1. Make your articles as short as is compatible with a clear expression of your facts or ideas. Many an article is not read because it is so long; or else its point is smothered in verbosity.

2. Leave Hippocrates and the other ancients undisturbed. They should rest now.

3. Do not spoil your work with a lot of quotations from foreign authors. Refer to them, if you must, in a footnote.

4. Have your paper typewritten and with wide-spaced lines; and,

5. Keep a copy.—*South. Med. Jour.*

Medicolegal

Liability for Operations Performed without Consent in Charitable Hospitals

(*Schloendorff vs. Society of New York Hospital (N. Y.), 105 N. E. R. 92*)

The Court of Appeals of New York affirms a judgment for the defendant hospital in this action wherein the plaintiff sued for damages alleged to have been sustained from an operation alleged to have been performed on her in the defendant hospital without her consent. The court says that, taking the plaintiff's version of the case, she went to the hospital suffering from some disorder of the stomach, and later consented to an examination under ether in order that the character of a lump which had been discovered might be determined, but that there must be no operation; yet, while she was unconscious, a tumor was removed. Her testimony was that this was done without her consent or knowledge, although that was sharply contradicted. Following the operation, and, according to the testimony of her witnesses, because of it, gangrene developed in her left arm, some of her fingers had to be amputated, and her sufferings were intense.

The Court says that every human being of adult years and sound mind has a right to determine what shall be done with his own body; and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages. This is true, except in cases of emergency when the patient is unconscious, and when it is necessary to operate before consent can be obtained.

The fact that the wrong complained of here was trespass, rather than negligence, distinguished this case from most of the cases that have preceded it. In such circumstances the hospital's exemption from liability could hardly rest on implied waiver. Relative to this transaction, the plaintiff was a stranger. She had never consented to become a patient for any purpose other than an examination under ether. She had never waived the right to recover damages for any wrong resulting from this operation, for she had forbidden the operation. In this situation, the true ground for the defendant's exemption from liability was that the relation between a hospital and its physicians is not that of master and servant. The hospital does not undertake to act through them, but merely to procure them to act on their own responsibility. The wrong was not that of the hospital; it was that of physicians, who were not the hospital's servants, but were pursuing an independent calling, a profession sanctioned by a solemn oath, and safeguarded by stringent penalties. If, in serving their patient, they violated her commands, the responsibility was not the hospital's; it was theirs. There is no distinction in that respect between the visiting and the resident physicians. Whether the hospital undertakes to procure a physician from afar, or to have one on the spot, its liability remains the same.

It is also true of nurses, as of physicians, that, in treating a patient, they are not acting as the servants of the hospital. The hospital undertakes to procure for the patient the services of a nurse. It does not undertake, through the agency of nurses, to render those services itself. Whatever the nurse does in the preliminary stages is done, not as the servant of the hospital, but in the course of the treatment of the patient, as the delegate of the surgeon to whose orders she is subject. The hospital is not chargeable with her knowledge that the operation is improper, any more than with the surgeon's.

Waivers of Privilege

(*State vs. Long (Mo.), 165 S. W. R. 748*)

The Supreme Court of Missouri says that it concedes the statute of privilege to be a wise one, but it should never be so construed as to make it both a shield and a dagger at one and the same time. If the patient is suffering from a malady, the physicians should not be allowed first to bring to light that affliction of the patient. The very purpose of the statute

is to hide, as with a veil, the malady and trouble for which the physician treated her, and what may have passed between them in the confidential relationship of physician and patient. But when the veil has been lifted by the patient, or with her consent, and the secrets of the sick chamber are given to the world, what logic is there in saying that the patient can clog the wheels of justice itself, by closing the mouth of other physicians, who know the real facts? In other words, if the patient raises, or permits to be raised, the veil of secrecy, with lying lips as to what the conditions were, should this waiver of secrecy still leave to her the power of suppressing the truth, by objecting to other physicians who about the same time treated her for the same alleged trouble? The court thinks not. In other words, if a patient is suffering from a given malady, and is treated by several physicians near the same time, for the same trouble or malady, then if she and one of her physicians with her consent make public the character of her trouble, she has waived the right longer to keep the exact character of that trouble secret, and the other physicians are competent to testify as to what this malady or trouble was in reality. Any other rule would be but to permit a patient in a court of justice to play both fast and loose.

So, if a patient is injured in a railway wreck and calls several physicians in the course of a reasonable time to treat him for such injuries, changing at times from one to another, but all treating him for the selfsame trouble, then if the patient breaks the secrecy by permitting one to testify as to the character of his injury, it is broken as to all. Any other construction of the doctrine of waiver (a doctrine thoroughly recognized in this state) would permit the patient to continue to employ physicians until he got one to his choosing, and, when he did so, could make him the sole agent to make public the secret of the sick-room. Such a course would be an abhorrent fraud on the courts, and one for which they should not stand. Justice should not be trifled with in any such manner. And, if privilege is once waived, it remains waived until the determination of the case, it matters not how many trials may be required.

Emergency Requirements for Injured Railway Employees

(Tippecanoe Loan & Trust Co., administrator, vs. Cleveland, Cincinnati, Chicago & St. Louis Railway Co. (Ind.), 104 N. E. R. 866)

The Appellate Court of Indiana, Division No. 1, says that if an employee of a railway company is injured as a result of hazards to which his employment exposes him, and, if his injuries are of such a nature as to render him incapable of caring for himself, it becomes the duty of the company to take such steps as are reasonably necessary and proper, under the circumstances, to prevent an aggravation of the injury through exposure, or for the want of medical or surgical assistance. Under such circumstances, if the servants of the company knowingly leave such injured person to die of exposure, or to bleed to death from his wounds, a legal responsibility for such consequences will be imposed on the company; and, if they take him into their custody, they must exercise reasonable care in the treatment accorded him. Under such circumstances the common instincts of humanity require that the helpless injured person should be taken in charge and removed to a place of safety, and that, if necessary, medical or surgical aid should be provided. This duty has been recognized by the Supreme Court of this state as one which arises in extraordinary cases in which medical or surgical assistance is imperatively required to save life, or to prevent further serious bodily injury. It is said that the duty arises with the emergency, and with it expires. In this case a section-hand in the employ of the defendant had his leg broken and severely cut, and was rendered unconscious and incapable of taking care of himself. There were some averments in the complaint to the effect that the company's physician, who was the first to treat the injured man, was negligent in failing to disinfect the wound, and to remove the gravel, sand, cinders, and other foreign substances from the wound, and that as a result blood poisoning ensued, which resulted finally in death. It is well settled in Indiana, however, that a railway company cannot be held liable for damages resulting to one of its injured employees as the result of the negligence of a surgeon called by the company to render surgical aid to such employee. Therefore, as the complaint did not aver that the defendant or its agents were negligent in selecting and employing an unskilled or incompetent surgeon, the defendant could not be held liable for the negligence or unskilfulness of the surgeon whom it called.

Society Proceedings

COMING MEETINGS

Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
American Roentgen Ray Society, Cleveland, Sept. 9-12.
Colorado State Medical Society, Boulder, Sept. 8-10.
Indiana State Medical Association, Lafayette, Sept. 24-25.
Kentucky State Medical Association, Newport, Sept. 23-25.
Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
Michigan State Medical Society, Lansing, Sept. 11-12.
Oregon State Medical Association, Portland, Sept. 10-11.
Pennsylvania State Medical Society, Pittsburgh, Sept. 21-24.
Utah State Medical Association, Salt Lake City, Sept. 29-30.
Washington State Medical Association, North Yakima, Sept. 21-23.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXXI, No. 1, pp. 1-232

1 Relations of Internal Medicine to Psychiatry. L. F. Barker, Baltimore.
2 *What is Paranoia? E. S. Abbot, Waverly, Mass.
3 General Paralysis as Public Health Problem. T. W. Salmon, New York.
4 Differential Diagnosis of General Paresis. A. Meyer.
5 *Is There an Increase Among the Dementing Psychoses? C. P. Bancroft, Concord, N. H.
6 Analysis and Interpretation of Dreams Based on Motive of Self-Preservation. M. Solomon, Chicago.
7 *Brain Atrophy in Relation to Insanity. A. J. Rosanoff, Kings Park, N. Y.
8 *Similar and Dissimilar Psychoses in Relatives. C. Ricksher, Kankakee, Ill.
9 Intoxication Psychosis Associated with Cirrhosis of Liver. G. H. Williams, Columbus, Ohio.
10 Atypical Modes of Onset in Dementia Praecox. S. N. Clark, Kankakee, Ill.

2. **What is Paranoia?**—Unless one uses the word merely in a symptomatic or descriptive sense (in which case it is an unnecessary synonym for the old delusional insanity), Abbot says, paranoia is a psychosis, but not a disease process. It is neither a pure affect-psychosis nor a pure ideation-psychosis, but rather a combined associational affect-ideation-psychosis. It is a continuous self-perpetuating faulty association of ideas and affects without disturbance of the thinking or affective or conative processes of such. It is purely functional, but not related to the manic-depressive or dementia praecox psychoses, which are ordinarily, though to his mind wrongly, called functional. Hence it does not lead to dementia, except in the line of its own evolution and it does not necessarily have any of the symptoms of the other psychoses except delusions, which may occur in all of them. Its mechanism is that of prejudice but the basal complexes involved are very intimate and personal ones with correspondingly strong and durable affects. This conception gives some therapeutic hope, realized by Abbot in at least one case.

5. **Are Dementing Psychoses Increasing?**—Bancroft feels that while it is demonstrably certain that paresis has increased during the last twenty-five years, it is by no means equally certain that an actual increase in the other dementing

psychoses has occurred. Fundamental conditions are much the same now as they were fifty years ago. With the exception of parasyphilitic brain conditions the actual disparity between the functional diseases of the mind and the dementing psychoses is probably not much greater now than formerly, making due allowance for increase in population. Certain prophylactic endeavor is suggested by this cursory survey. Curtailment of the immigration of mental defectives at the source, restriction of alcoholic indulgence, prevention of syphilitic infection, stricter segregation of the feeble-minded, greater intelligence in entering on the marriage relation, Bancroft suggests, are some of the steps by which a decrease among the dementing psychoses may be attained.

7. **Brain Atrophy in Relation to Insanity.**—The more important results of Rosanoff's analysis are: The index of atrophy seems to vary somewhat with age, showing increase as age advances. The index to atrophy seems also to vary with the state of nutrition, though not so clearly, showing apparently some increase in cases of emaciation. In cases of insanity the index of atrophy varies with the clinical group; it is greatest in cerebral arteriosclerosis; it is greater in general paresis and in senile dementia than in dementia praecox.

There is close correlation between degree of mental deterioration observed clinically and index of atrophy determined at autopsy: that is to say, mental deterioration, of whatever nature, goes hand in hand with brain atrophy. There is close correlation between duration of the deteriorating psychosis and index of atrophy. Inasmuch as interest will naturally center on dementia praecox, rather than on psychoses occurring on a basis of coarser and better understood brain lesions, a special analysis of the data pertaining to that group has been undertaken with a view to determining the share of the atrophy which is in that connection to be attributed to senility or to emaciation. This analysis has shown Rosanoff that if senile involution plays any part in the production of brain atrophy in dementia praecox, that part is but a slight one; the bulk of the atrophy is not due to it. The analysis has also shown that emaciation, like senile involution, plays but an unimportant part, if any, in the production of brain atrophy in dementia praecox; the bulk of the atrophy is not due to it. The conclusion is therefore drawn by Rosanoff that dementia praecox is associated in some way with changes in the brain which lead to atrophy.

8. **Similar and Dissimilar Psychoses in Relatives.**—Ricksher found that similar psychoses occur in about 50 per cent. of parents and children, and in brothers and sisters occur in about 66 per cent. of the cases. The age of onset of the psychosis as a rule is earlier in the child than in the parent. When the father and daughter or mother and son each suffer from dementia praecox the difference in the age of onset is most marked. Idiot children are not found as often as children with less severe mental disorders. Epilepsy in their cases was transmitted through the fathers to the sons. The transmission from mother to child is only a very little more frequent than from father to child. Similar psychoses occur in brothers and sisters in about 66 per cent. of cases. Dementia praecox is the most frequent psychosis found in brothers and sisters and is the psychoses most frequently found in one child when the brother or sister suffers from some other mental disorder. Mental disease is more apt to appear earlier in sisters than in brothers, except that when dementia praecox is found in one child and manic-depressive insanity in the other the average of onset is less in the brother than in the sister whether the brother suffers from manic-depressive insanity or from dementia praecox. Family histories and the type of psychoses in other insane relatives are not obtainable and definite conclusions regarding the effects of insanity in relatives on the production of dissimilar psychoses in the child cannot be drawn.

American Journal of Roentgenology, Detroit

May, I, No. 7, pp. 287-312

11 Direct Method of Diagnosis of Duodenal Ulcer by Means of Roentgen Ray. A. W. George and I. Gerber, Boston.

12 *Roentgen Examinations for Head Injuries. A. L. Gray, Richmond, Va.

13 Experiments in Standardization of Dosage for Roentgen Therapeutics. G. W. Holmes, Boston.

12. Abstracted in THE JOURNAL, Nov. 15, 1913, p. 1842.

Archives of Pediatrics, New York

July, XXXI, No. 7, pp. 481-560

14 *Schick Reaction and Its Practical Applications. W. H. Park, A. Zingher and H. M. Serota, New York.

15 *Treatment of Recurrent Sibilant Bronchitis. B. K. Rachford, Cincinnati.

16 Splenic Enlargement in Infancy and Childhood. C. V. Weller, Ann Arbor, Mich.

17 Cases of Diarrhea Treated with Culture of Bacillus Bulgaricus. C. W. Berry, Brooklyn.

18 Children's Tuberculosis Class at Sanatorium. M. Solis-Cohen, Philadelphia.

14. **Schick Reaction.**—The results of immunizing injections and laboratory experience in testing the blood for antitoxin have shown that only those individuals contract diphtheria who have no antitoxin or only a minute amount in their blood and tissues. The methods previously in use for estimating antitoxin, and thus separating the susceptible from the non-susceptible individuals, have been too troublesome to be of practical value in routine cases. Schick recently published a simple clinical test by which this can be accomplished. The reaction depends on the local irritant action of minute quantities of diphtheria toxin when injected intracutaneously. If antitoxin is absent, or present only in very small amounts, insufficient for protection, a positive reaction will appear in twenty-four to forty-eight hours. This is characterized by a circumscribed area of redness and slight infiltration which measures from 1 to 2 cm. in diameter. It persists for seven to ten days, and on fading shows superficial scaling and a persistent brownish pigmentation. The amount of toxin injected as advised by Schick is 1/50 MLD for the guinea-pig in 0.1 c.c. of normal saline. The authors prefer 1/50 MLD in 0.2 c.c.

The Schick reaction was carried out by them during the past six months on all patients entering the scarlet-fever pavilion of the Willard Parker Hospital. In all, 700 patients were thus tested, and of these, 400, or 57 per cent., gave negative reactions. Only cases giving positive reactions were immunized; those giving a negative reaction received no immunization, but were carefully observed. Although more than a quarter of the negatively reacting patients became bacillus carriers during their stay in the wards, no cases of clinical diphtheria developed among them. The remaining 300 patients who gave positive reactions received in practically all cases some form of toxin-antitoxin mixture. Among those who reacted insufficiently to the attempt at active immunization with toxin-antitoxin mixtures, 42 developed clinical diphtheria; of these, 20 were nasal, 20 tonsillar and 2 laryngeal diphtheria. The great majority of the cases were of a mild type. The percentage of individuals susceptible to diphtheria is greatest between the ages of 1 and 4 years. It is less during the second six months of life and less in older children and in adults.

15. **Treatment of Recurrent Sibilant Bronchitis.**—Rachford calls attention to the clinical fact that (1) recurrent rhinitis and recurrent sibilant bronchitis, which are sometimes associated with rather severe asthmatic attacks, and almost always with a severe paroxysmal cough, are very commonly caused by some kind of food intoxication; (2) that recurrent attacks of rhinitis and whistling bronchitis, which is one of the most common symptom groups the physician is called on to treat, may be in most instances almost or quite relieved by dietetic treatment. He insists that this symptom group occurs not infrequently in children who have a predisposition to migraine, recurrent vomiting and urticaria.

During the attack sweets, butter fats, eggs and raw fruits are especially to be avoided. Strawberries, rhubarb, tomatoes, salads, shell-fish, tea, coffee, pastry, gravies, cream, cod-liver oil and alcohol are excluded from the diet. Saccharin is to be used instead of sugar. Skimmed milk may be allowed. The following foods may be allowed: beef, mut-

ton, fowl and fish in moderation, cereals, bread, all vegetables not above prescribed, cooked fruits, skimmed milk and thick soup.

About two months after the patient has recovered from the attack the above diet may be carefully modified by adding one egg a day to the diet, then perhaps two weeks later, milk containing 4 per cent. fat may be substituted for skimmed milk. Some few weeks later all raw fruits, oranges excepted, may be added to the diet. Some weeks later, small quantities of sugar may be used for sweetening cereals and stewed fruits. After five or six months the child may return to his original diet, with the exception that he must eat sparingly of sweets and must eat nothing between meals. If the symptom-group returns on the addition of any article of diet, that particular food is to be permanently excluded from the diet.

During the attack the patient is to have all the outdoor air he can get with as little exercise as possible. As he recovers from his attack, exercise in the open air is advisable. During the attack, constipation should be relieved by some of the magnesium salts. Milk of magnesia or calcined magnesia are especially suitable for this purpose. Magnesium sulphate may be used in small doses in older children. Alkalies in the form of sodium bicarbonate, potassium bicarbonate or potassium citrate should be given in fair-sized doses, 5-grain capsules three or four times a day. In younger children who object to the taste of sodium bicarbonate direct the mother to distribute through the child's food a teaspoonful of this salt each day. Tincture of belladonna should be given for a short time in 2 to 4 minim doses three times a day. If constipation cannot be controlled by diet some form of cascara or other palatable laxative should be used as indicated. The belladonna is discontinued, but an alkali in some form should be given for six to eight weeks. Sodium bicarbonate is the best alkali for this purpose and may be given in moderate-sized doses once or twice a day.

Boston Medical and Surgical Journal

August 6, CLXXI, No. 6, pp. 217-252

19 Problem of Infection in Tuberculous Families. J. B. Hawes, Boston.
20 Summer Diarrheas. I. D. Steinhardt, New York.
21 Modern Treatment of Inebriety. I. H. Neff, Foxborough, Mass.
22 Occupation Therapy in Organic Diseases. H. J. Hall, Marblehead, Mass.
23 New Method of Treatment of Chronic Dacryocystitis. C. M. Cobb, Lynn, Mass.

Bulletin of Johns Hopkins Hospital, Baltimore

July, XXV, No. 28, pp. 195-222

24 *Involution of Uterus and Its Effect on Nitrogen Output of Urine. J. M. Slemons, San Francisco.
25 *Normal Amount of Diastatic Ferment in Feces and Its Variation in Certain Diseases of Pancreas in Achylia Gastrica. T. R. Brown, Baltimore.
26 *Peripheral Origin of Surgical Shock. F. C. Mann, Indianapolis.
27 Normal Diastase Content of Urine. T. R. Brown and C. W. Smith, Jr., Baltimore.

24. **Involution of Uterus and Effect on Nitrogen Output of Urine.**—As the results of Slemons' investigations, it is apparent that the process of involution causes a rise in the urinary nitrogen and that the amount of excessive elimination corresponds to the nitrogenous content of the non-involuted uterus. His observations offer confirmatory evidence of this fact from three points of view: First, by the comparison of the puerperal and postpuerperal periods when the uterus has not been removed; second, from the comparison of the aggregate excretion in cases in which the uterus was removed and in which it was not; and third, from the comparison of the actual daily difference in such cases with the theoretical amount of nitrogen which would be expected as a result of the involutionary process. Slemons, therefore, concludes that waste products from the involuting uterus pass into the circulation, are excreted by the kidneys, and in some measure throw additional work on these organs during the early part of the puerperium.

It does not follow, however, that the diet should be restricted in the puerperium. On the contrary, Slemons' observations indicate that the increase in the excretion of nitrogen is not large enough to require such restriction, provided the patient is normal. If any therapeutic inference may be drawn, it is in the nature of a justification of the present-day tendency to allow a generous diet to recently delivered women. On the other hand, in patients suffering from toxemia of pregnancy, the additional work which the kidneys must perform in the puerperium does become a matter of practical importance. In such circumstances these organs should be given the fullest opportunity to recover from the strain to which they have been subjected, and, with this end in view, the diet should be limited. Such precaution is necessary not only because the renal cells have been damaged, but also because an excretory capacity somewhat greater than normal is desirable. The inspection of the urine-chart of a convalescent eclamptic teaches that in the days immediately following delivery the kidneys are eliminating an unusually large amount of waste products, even though the consumption of food is small. Formerly, the large nitrogenous excretion in such cases was attributed to the elimination of waste material which had previously been retained, and whose retention had caused the toxemia. Such a view is evidently incorrect, as Slemons' observations show that the large excretion of nitrogen in these, as well as in normal cases, is due to the involution of the uterus.

25. **Diastatic Ferment in Feces in Certain Diseases of Pancreas.**—From Brown's study on the diastase content of feces in normal and in certain pathologic conditions the following conclusions are drawn: The stool, if a rigorously exact method is carried out as to food, purgative employed, preservation of specimen, estimation of ferment, etc., furnishes a diastase content within definite limits. The effect of waiting too long after the stool has been obtained before making the examination, the influence of variations in temperature in the place in which it is kept, and of different laxatives and different foods, is so great as to render results obtained by methods in which insistence on such a rigorous technic has not been made of much less value.

Extensive carcinoma of the pancreas showed no diastase in the tube of lowest dilution in Brown's method, and this absence of ferment should prove of great help in the diagnosis of this condition. In chronic pancreatitis diastase was present in the stool, but in markedly diminished amounts. In achylia gastrica the diastase content of the stool was practically normal in all the cases examined. This, in the first place, suggests that in the absence of hydrochloric acid some other method of pancreas activation is called into play, and, in the second place, that the diarrhea met with in certain of these cases of achylia gastrica—the so-called gastrogenous diarrhea—is not of pancreatic origin.

26. **Peripheral Origin of Surgical Shock.**—Mann found it impossible to reduce the anesthetized animal to a state of shock by any degree of sensory stimulation, provided all hemorrhage is prevented and its abdomen is not opened. He has been unable to show that acapnia is a primary factor in the production of shock. Shock is not due to disturbance of the respiration, but the respiratory center is more quickly injured than any other vital center by shock. The vasomotor center is not depressed nor fatigued in shock. It is the most resistant of all the vital centers. The peripheral and untraumatized visceral arteries are constricted in shock. Shock is not due to primary failure of the heart nor to involvement of the cardio-inhibitory or cardio-accelerator mechanism. It is possible to produce the signs of shock by the use of excessive heat or cold. The easiest and most certain method of producing shock is by exposure and traumatization of the abdominal viscera. This, judging from the literature, has been the method used by nearly all investigators of shock. Shock produced by exposure and trauma of the abdominal viscera is not due alone to a paralysis of the vasomotor mechanism of the splanchnic area.

The cause of shock, Mann says, is the tremendous loss of red cells and fluid from the blood, due to the reaction of the great delicate vascular splanchnic area to irritation—an acute inflammation of the peritoneum, due to trauma and

exposure to the air and changes of temperature. The great amount of this loss is apparent when it is taken into consideration that the peritoneum has an extent as great as the entire cutaneous surface of the body. The factors involved in their reaction to irritation are the same as those involved in any other local inflammatory process, and certainly do not involve the nervous system to any greater extent. The profound general effect is due to the actual loss of red cells and fluid from the circulating blood through stasis, diapedesis, exudate, endothelial changes, etc. In the course of operations in which the abdomen has not been opened, a loss of fluid and cells from the blood occurs. But the loss is, except when great areas of subcutaneous tissue have been exposed, comparatively unimportant.

Certain accessory factors which help to produce the condition of shock are muscular relaxation, decrease in intra-abdominal pressure and impaired respirations, all of which tend to decrease the amount of blood returned to the heart. The effect of chilling and the use of hot applications should be considered. Degenerative changes in the cells of the central nervous system are the result and not the cause of shock. General anesthesia of moderate depth prevents painful impulses from affecting the nerve cells of the central nervous system. Nerve blocking under such conditions is useless, so far as the prevention of shock is concerned. A relatively slight decrease in blood-supply may be sufficient to depress markedly the cells of the cerebral cortex. Care should therefore be taken to exclude this factor before ascribing such depression to inhibition.

Mann is of opinion that the use of word "shock" should be avoided, and instead an accurate and detailed description of the patient's condition should be given. If the term be used at all it should be applied to the condition in which without any grossly discernable hemorrhage having occurred, the amount of circulatory fluid is greatly diminished on account of stagnation of the blood in the smaller veins and capillaries or by exudation of the fluid and cellular elements of the blood from the same.

Cleveland Medical Journal

July, XIII, No. 7, pp. 447-522

28 Occupational Neuroses—Pathogenesis and Examples of Treatment. T. A. Williams, Washington, D. C.
29 Ancestry of Homo Sapiens. T. W. Todd, Cleveland.
30 Medical Experiences in Korea. A. I. Ludlow, Seoul, Korea.
31 Temporo-Sphenoidal Abscess Secondary to Chronic Suppurative Otitis Media — Operation — Recovery — Radiograph Findings. J. M. Ingersoll, Cleveland.
32 Deaf Child and His Education. G. C. Burton, Cleveland.
33 Mating of Unfit. T. S. McWilliams, Cleveland.

Indiana State Medical Association Journal, Fort Wayne

July, VII, No. 7, pp. 309-356

34 Silent Areas of Brain; Report of Three Cases. B. Holmes, Chicago.
35 Treatment of Heterophoria and Heterotropia. F. A. Morrison, Indianapolis.
36 Symptomatology of Urethral Stricture. P. G. Hamer, Indianapolis.
37 Tuberculosis of Organs of Special Sense. W. C. Dyer, Evansville.

Journal of Medical Research, Boston

July, XXX, No. 3, pp. 261-540

38 *Coccidioides Immitis and Coccidioidal Granuloma. W. J. MacNeal and R. M. Taylor, New York.
39 *Effect of Quinin on Rabbits Inoculated with Rabies. L. Frothingham and J. Halliday, Boston.
40 Incidence and Inheritability of Spontaneous Tumors in Mice. M. Slye, Chicago.
41 *Anaphylaxis. R. Weil, New York.
42 Glomerular and Arterial Lesion Produced in Rabbit's Kidneys by Diphtheria Toxin. C. Frothingham, Jr., Boston.
43 Lipo-amlyoid Degeneration. O. Klotz, Pittsburgh.
44 Serum Cholesterol and Wassermann Reaction. P. G. Weston, Warren, Pa.
45 *Influence of Splenectomy of Certain Organs and Organ Extracts on Hemopsonins of Blood Serum. H. T. Karsner, H. H. Amiral and A. V. Bock, New York.
46 *Experiments in Anaphylaxis with Lipoids of Tubercle Bacillus. B. White, Brooklyn.
47 *Staining of Yeasts by Gram's Method. A. T. Henrici, Minneapolis.
48 Tumors in Lungs of Mice. M. Slye, H. F. Holmes and H. G. Wells, Chicago.
49 Two "Atoxic" Strains of Diphtheria Bacilli. H. R. Brown and T. Smith, Boston.
50 Cholesterin—Heart Antigen Proposed by Walker and Swift. C. W. McClure, Iowa City, Ia.
51 *Reaction of Guinea-Pig to Virus of Typhus Fever. J. F. Anderson, Washington, D. C.
52 *Attempt to Immunize Guinea-Pig Against Tuberculosis by Use of Graduated, Repeated Doses of Living Tubercle Bacilli. L. Brown, F. H. Heise and S. A. Petroff, Saranac Lake, N. Y.
53 Classification of Streptococci. H. W. Lyall, Brooklyn.
54 *Hemolysin Production by Streptococci. H. W. Lyall, Brooklyn.
55 New Serum and Liver Substances as Levuloses in Trypanosomiasis. K. Schern, Ames, Ia.

38. **Coccidioidal Granuloma.** — Coccidioidal granuloma, according to MacNeal and Taylor, is a very definite specific infectious disease, subacute or chronic, and tending to a fatal issue. Twenty-four cases have been recognized in various parts of the western hemisphere, most of them in California. The disease has been observed almost exclusively in adult males. The histologic changes in the lesions very closely resemble those of tuberculosis. Differential diagnosis depends on finding the specific micro-organisms. *Coccidiodes immitis* (Rixford and Gilchrist, 1896) is a well-characterized species of mold belonging to the Ascomycetes. In the animal body it exists as spheres enclosed in doubly contoured capsules and multiplies by endogenous spore formation. In aerobic cultures a septate mycelium is produced and in old cultures chlamdospores, which resemble somewhat the parasitic form of the organism. In anaerobic cultures in ascitic fluid of gelatinized horse-serum to which sterile tissue has been added, the parasitic forms continue to multiply for a time by endogenous spore formation, much as they do within the animal body.

Coccidioides immitis is distinctly different from the budding fungi found in human diseases variously called blastomycosis, oidiomycosis, Saccharomycosis or blastomycetic dermatitis, of which the budding parasite, *Cryptococcus dermatidis* (Gilchrist and Stokes, 1898), is perhaps the best known.

39. **Effect of Quinin on Rabbits.**—Neither quinin bisulphate nor quinin and urea hydrochlorid—dissolved in water and administered subcutaneously—had any curative effect on rabbits which showed symptoms of rabies after intracerebral subdural and intramuscular inoculation with street virus. Subcutaneous injections of quinin bisulphate and quinin and urea hydrochlorid caused a local reaction with necrosis and, in the control rabbits, subsequent sloughing.

41. **Anaphylaxis.**—When a guinea-pig is sensitized by the intraperitoneal injection of a large amount of the serum of a rabbit immunized against horse-serum, Weil states it becomes possible by Dale's method to determine the persistence of sensitization to horse-serum over a period of fifteen days. The degree of sensitization gradually diminishes. At the same time there is a gradual development of sensitization toward rabbit-serum. Coincidently, the presence of circulating antibodies toward rabbit-serum is demonstrated in the serum by using it passively to sensitize normal guinea-pigs. These data are interpreted to indicate that both antigen (rabbit's serum), and antibody thereto, coexist for some time in the cells of a guinea-pig immunized by large doses of a foreign serum; and that the blood at the same time contains free antibodies. The suggestion is made that the persistence of antigen in the cell is a factor which contributes materially to the resistance of animals sensitized by massive doses of antigen.

45. **Influence of Splenectomy.**—Provided the spleen has been removed for a period of time less than a week and more than two days, the intravenous injection of a specific hemolytic immune serum, in doses large enough to produce hemoglobinuria, is followed by marked phagocytosis of erythrocytes by the endothelial cells of the lymph-nodes and liver. In the lymph-nodes the process starts about three hours after the injection of immune serum, reaches its height about twenty-four hours after the infection and is practically complete in forty-eight hours, when the endothelial cells are found to contain large quantities of pigment, presumably as the results of blood-destruction.

A study of hemopsonins of the blood-serum under the experimental conditions indicated in the text fails to show that the phagocytosis of erythrocytes, so prominent in the lymph-nodes of the splenectomized animal following a fairly large intravenous dose of specific hemolytic immune serum, is dependent on local or general variations in hemopsonin in the splenectomized animal as influenced by organ extracts of normal and of splenectomized animals.

46. **Experiments in Anaphylaxis.**—The cold alcohol soluble and hot alcohol soluble—cold alcohol insoluble constituents of three lots of virulent tubercle bacilli were prepared and tested by White for antigenic properties by the anaphylactic reaction. All the preparations when injected intraperitoneally into guinea-pigs in doses of from 0.025 gm. to 0.100 gm. failed to sensitize the animals to a subsequent intravenous injection of from 0.75 to 2 cubic centimeters of an extract emulsion of the same strain of tubercle bacilli. (The minimum fatal dose of the extract emulsion was 0.3 cubic centimeter for an animal previously injected intraperitoneally with 0.5 cubic centimeter of a watery extract of tubercle bacilli.) None of the preparations when injected intravenously into guinea-pigs previously sensitized with tuberculoprotein produced any anaphylactic symptoms whatever. The intravenous injection of the lipoid preparations in animals sensitized with tuberculoprotein produced no true anti-anaphylaxis to a subsequent intravenous injection of extract emulsion of tubercle bacilli. When the extract emulsion was injected one hour after the intravenous lipoid injection a slight tolerance or refractoriness was noted, but no protection was observed when the second injection was delayed for nineteen to twenty days. None of the preparations sensitized animals to a subsequent injection of the corresponding lipoid.

47. **Staining of Yeasts by Gram's Method.**—It is shown by Henrici that yeast cells retain Gram's stain more firmly than the common Gram-positive bacteria, and unlike the bacteria, the cytoplasm of the yeast cell is not homogeneous with regard to its ability to retain the stain, certain granules appearing in the decolorizing cell which hold the dye longer than others. It is suggested that the ability of these granules to resist decolorization is in direct proportion to their ability to resist antolysis.

51. **Reaction of Guinea-Pig to Typhus Virus.**—There apparently exists a natural immunity in the guinea-pig, similar to that found in the monkey, to typhus fever. In Anderson's experience of 4.7 per cent. of the guinea-pigs failed on first injection to react to an inoculation of proven virulent guinea-pig typhus-fever blood. Fifty-six per cent. of the guinea-pigs tested failed to react to a first injection of blood from human cases of typhus fever.

The passage of the virus of typhus fever through sixty-nine generations in the guinea-pig apparently produced no change in its virulence or infectivity for that animal. After sixty-nine passages through the guinea-pig the typhus-fever virus showed no apparent change in its infectivity for the monkey.

52. **Attempt to Immunize Guinea-Pig against Tuberculosis.**—The authors' experiments show that repeated doses of even virulent tubercle bacilli prolong the life of the animal far beyond that of the controls. They suggest that the explanation lies in the fact that the superinfection may be held for a time in abeyance by the presence of a slight active tuberculosis focus. It is probable from the autopsy findings that all the treated guinea-pigs would have eventually died from chronic tuberculosis.

54. **Hemolysin Production by Streptococci.**—Lyall maintains that the hemolytic titer does not afford any absolute criterion of virulence. The production of a potent hemolysin in both cultures is dependent on the nature and proportions of enriching substances, the reaction of the medium and the time of incubation. The hemolysin appears to be closely associated with the bacterial bodies and not to be in solution. The hemolysin does not appear to be in the nature of an enzyme. The hemolysin is destroyed by a temperature of 56 C. for thirty minutes. It disappears within forty-eight hours at incubator temperature. Normal serums of sheep, guinea-pig, rabbit, cow and man contain appreciable amounts of antistreptolysin. Salvarsanized serums possess a markedly increased inhibitory power on the hemolytic action of streptococci. Hemolysin production is inhibited by the addition of sugar. This occurs most uniformly in the case of dextrose. It does not appear to be definitely associated with the amount of acid produced.

Kentucky Medical Journal, Bowling Green

July, XII, No. 14, pp. 435-452

56 Milk. W. E. Gary, Louisville.
57 Management of Nephrolithiasis. H. H. Grant, Louisville.
58 Hernia. G. P. Grigsby, Louisville.

Laryngoscope, St. Louis

July, XXIV, No. 7, pp. 645-708

59 Technic for Removal of Intrinsic Growths of Larynx. R. C. Lynch, New Orleans.
60 Laryngitis Submucosa Subglottica Acuta. C. W. Richardson, Washington, D. C.
61 Primary Sarcoma of Trachea. J. M. Ingersoll, Cleveland.
62 Use of Bronchoscope in Direct Examination of Larynx, Trachea, Bronchi and Esophagus. P. Schoonmaker, New York.
63 Bacterins in Treatment of Diseases of Nose and Throat. F. O. Lewis, Philadelphia.
64 Bacterins in Treatment of Diseases of Ear. G. M. Coates, Philadelphia.
65 Vaccine Treatment in Accessory Sinus Suppuration. R. H. Skillern, Philadelphia.

Maine Medical Association Journal, Portland

July, IV, No. 12, pp. 1925-1964

66 Medical Charity and Medical Legislation. W. C. Peters, Bangor.
67 Value of Social Service Work in Hospitals as Part of Efficient Diagnosis and Treatment. R. C. Cabot, Boston.
68 Twilight Sleep. H. E. Milliken, Portland.

Medical Record, New York

August 8, LXXXVI, No. 6, pp. 233-278

69 Intestinal Antisepsis Through Biologic Aids. B. Stow, New York.
70 Acute Contagious Conjunctivitis, Originating in a Public Swimming Pool. S. H. Brown, Philadelphia.
71 Aspects of Visual Acuity. H. M. Friedman, New York.
72 Physiology of Worry. E. D. Forrest, Boston.
73 *Medical Aspect of Athletics. R. E. Coughlin, Brooklyn.
74 Acute Suppurative Otitis Media. H. L. Fifield, Syracuse, N. Y.
75 *Rhinologic Aspect of Some Mental Disturbances. J. A. Hagemann, Pittsburgh.

73. **Medical Aspect of Athletics.**—It has been proved beyond question that immoderate college athletics lead to physiologic hypertrophy of the heart. Athletic training leads at first to physiologic hypertrophy, but when prolonged and marked by severer athletic contests, Coughlin says it usually leads to hypertrophy plus dilation of a variable degree, frequently marked by valvular insufficiency. Functionally the hypertrophied heart, even when dilated and giving distinct evidence of valvular insufficiency, may prove more fitted to carry the man through a severe athletic contest than a normal heart would be. On the other hand, acute cardiac dilation occurs more frequently in athletes and men used to severe muscular strain than in the normal man and the effects are more prolonged and severe. Carefully collected statistics show that deaths of athletes are caused by the following diseases in the order of their frequency: cardiac diseases, tuberculosis, typhoid fever, pneumonia and Bright's disease. The dangerous games indulged in with fatalities in the order of the greatest danger are said to be football, baseball and boxing.

75. **Rhinologic Aspect of Some Mental Disturbances.**—A frequently unrecognized cause of mental depression, and sometimes suicide, in Hagemann's opinion, is empyema of the ethmoidal cells. The absence of a nasal outpouring may mislead one into making a negative diagnosis, although the patient is constantly or intermittently swallowing pus-bearing discharges which perhaps unnoted trickle down the posterior pharyngeal wall. The consequent autointoxication from the biochemical products liberated in the intestinal tract establishes a neurasthenic condition characterized by great despondency. Whether a direct action on the cerebral

association-centers may be exerted by an ethmoidal sinusitis, Hagemann says, is problematic. The lymph currents all tend in the opposite direction. Yet one might picture to oneself the possibility of noxious fluids finding their way into the brain via the sheaths of afferent nerves.

Michigan State Medical Society Journal, Grand Rapids

August, XIII, No. 8, pp. 459-513

76 Treatment of Pernicious Vomiting of Pregnancy. F. W. Lynch, Chicago.
77 Hypo-epinephry. R. G. Leland, East Leroy.
78 Genito-Urinary Infections, More Especially Those Originating in the Kidneys. O. A. Hart, St. Johns.
79 West Indian Impressions. W. J. Stapleton, Jr., Detroit.
80 Fracture of Left Temporal Bone. J. T. Cooper, Muskegon.
81 Case of Appendicitis of Unusual Symptomatology. J. D. Matthews, Detroit.
82 Case of Otitic Streptococcic Bacteremia. R. B. Canfield, Ann Arbor.
83 Diagnosis of Diseases Associated with Enlargement of Spleen. J. J. Moffett, Port Huron.

New York Medical Journal

August 8, C, No. 6, pp. 253-300

84 Lane's Auto-intoxication Complex and the Manifestations of Senility. I. L. Nascher, New York.
85 *Conservatism in Operative Treatment of Simple Fractures. G. Woolsey, New York.
86 Treatment of Diabetes Mellitus with Bacillus Bulgaricus. P. Horowitz, New York (to be continued).
87 Fractures of Upper End of Humerus (Analyses of 393 Cases). J. M. Hitzrot, New York.
88 Autoserum Treatment of Dermatoses. W. S. Gottheil, New York.
89 Gram Negative Streptococcus Pathogenic for Guinea-Pigs. J. G. Drennan, Rosebank, S. I., N. Y.
90 Some Signs of Danger in Labor, and How to Meet Them. J. O. Arnold, Philadelphia.
91 Frederick Forchheimer. O. Juettner, Cincinnati.

85. **Conservatism in Operative Treatment of Simple Fractures.**—For guiding rules in the conservative operative treatment of fractures, Woolsey says: In recent simple fractures, do not operate unnecessarily, only after nonoperative treatment has been tried and failed, as no operative treatment is exempt from danger. Be most careful as to asepsis. Use the simplest thing that meets the indications and avoid large foreign bodies in the tissues when possible. Judge each case by itself. In properly selected cases the operative treatment of fractures greatly improves the results.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

July, XIX, No. 1, pp. 1-38

92 *Abnormal Arrangement of Branches of Aortic Arch. J. W. Brodnax, Richmond.
93 Treatment of Goiter and Hyperthyroidism. A. G. Brenizer, Charlotte, N. C.

92. **Abnormal Arrangement of Branches of Aortic Arch.**—In the subject reported by Brodnax the aortic arch was placed somewhat more to the left and on a higher level in the thorax than normal, reaching not quite to the suprasternal notch. All of its branches arose by separate stems to the left of the median line, and in the following order; right common carotid, left common carotid, left subclavian, right subclavian. The right common carotid crossed obliquely in front of the trachea to gain the right side of the neck, in which it assumed its normal course; the left common carotid and subclavian occupied about their usual place; the right subclavian was the last branch of the arch, and was given off as low down as the body of the fourth thoracic vertebra, it then passed upward and to the right, behind the trachea and esophagus to gain its normal position in the interval between the scaleni muscles. The right vertebral was a product of the right common carotid. The branches of the thyroid axes, on both sides, arose by separate stems from their respective subclavian artery.

Vermont Medical Monthly, Burlington

July, XX, No. 7, pp. 177-198

94 Surgery of Large Intestine. E. M. Pond, Rutland.
95 Nurse in Private Practice Thirty-Three Years Ago and To-Day. J. B. Wheeler, Burlington.
96 Trained Nurse of To-Day. N. R. Bruce.

Tennessee State Medical Association Journal, Nashville

June, VII, No. 2, pp. 57-98

97 *Serum Diagnosis of Gonorrheal Infection. R. L. Jones and I. Simons, Nashville.
98 *Drug Habit in Tennessee. L. P. Brown, Nashville.
99 Chronic Appendicitis. R. A. Barr, Nashville.
100 Etiology and Treatment of Corneal Ulcers. A. C. Lewis, Memphis.
101 Placenta Praevia. J. S. Campbell, Gordonsville.

97. Abstracted in THE JOURNAL, May 16, p. 1583.

98. Abstracted in THE JOURNAL, May 2, p. 1427.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, London

July, VIII, No. 2, pp. 133-367

1 Entameba of Man in Panama Canal Zone. W. M. James.
2 Dysenteries in Canal Zone, with Special Reference to Amebic Dysentery. W. E. Deeks.
3 Emetine in Amebic Dysentery. W. E. Deeks.
4 Six Day Fever in Panama. W. E. Deeks.

British Medical Journal, London

July 25, II, No. 2795, pp. 161-220

5 Serum Diagnosis of Pregnancy and of Cancer. A. Leitch.
6 Position of Country Doctor in 1879 and To-Morrow. J. L. Thomas.
7 Sprue. P. H. Bahr.
8 *"Controlled" Use of New Tuberculin in Treatment of Pulmonary Tuberculosis. G. V. Stockdale and R. Hodson.
9 Sixty-Three Successive Cases of Enteric Fever Treated with Vaccines. W. P. MacArthur.
10 Hernia of Uterus, Vagina and Fallopian Tubes in a Boy (Hermaphrodite). L. R. Braithwaite and W. Craig.

8. **Tuberculin in Treatment of Tuberculosis.**—As many cases as possible of pulmonary tuberculosis (the criterion for which was the presence of tubercle bacilli in the sputum) were collected by Stockdale and Hodson and paired off in such a way that a febrile patient was paired with another febrile, while an afebrile was paired with an afebrile. Then by lot it was decided which should be given tuberculin, so that there should be no suggestion as to picking cases. Further, as fresh patients were admitted into the hospital, it was decided by lot which should be given tuberculin and which should act as controls.

The tuberculin selected to be used was the new tuberculin residue (T. R.), and it was decided to give minute doses, increasing the doses gradually every second or third day at first and later at longer intervals in the case of the afebrile patients, while the febrile patients received a dose every fifth or seventh day. The initial dose in the former case was 1/100,000 milligram, and was increased to 2, 3, 5, 8 and 12/100,000 milligram, and then again about three-quarters as much again every dose. In the febrile cases the original dose was 1/200,000 milligram tuberculin residue. The object was to work up to the strength of tuberculin residue the patient would take without producing a reaction. When a reaction did occur the patient was kept quiet, and after a few days the same dose was repeated and if no reaction followed the treatment was continued as before. If, however, a reaction occurred a second time, then a further period of rest from tuberculin was given and was followed by a smaller dose than those which produced reaction. The maximum dose reached was 1/10 milligram, and this in the case of one patient only.

With regard to the local lesion, tuberculin seems to have done good in the afebrile cases, and such cases formed less than 30 per cent. of the total. Tuberculin was apparently harmful to the intermittently febrile patients, who formed the bulk of the series. Tuberculin had no apparent influence in increasing the weight or in improving the general condition, and in both these cases the balance of improvement is on the side of the controls.

Indian Journal of Medical Research, Calcutta

April, I, No. 4, pp. 589-794

11 Experimental Leishmaniasis in Monkey and Mouse Induced by Parasites in Culture: R. Row.
12 Production of Localized Lesion by Leishmania Donovani in Macacus Sinicus. V. T. Korke.

13 Kala-Azar in Nowgong (Assam). F. P. Mackie.
14 Halteridium Parasite of Pigeon, Hemoproteus Columba, Celli and San Felice. H. W. Acton and R. Knowles.
15 Treatment of Swamps, Stream Beds, Ponds, Wells and Pools, with Destruction of Mosquito Larva. H. C. Wilson.
16 Malaria in Madras City. E. C. Hodgson.
17 Misleading Reactions Obtained with Precipitating Antisera and How to Avoid Them. W. D. Sutherland and G. C. Mitra.
18 *Standardization of Vaccines. H. C. Brown.
19 *Preparation and Standardization of Typhoid Vaccine. G. H. Blaker.
20 *Agglutination Reaction after Antityphoid Inoculation. A. W. Dyer.
21 Method of Estimating Amount of Gas Produced by Gas-Forming Bacteria. J. Cunningham.
22 Filariasis in Cochin. J. A. Cruickshank and R. E. Wright.

18. **Standardization of Vaccines.**—The weight of bacteria in the dry condition according to Brown is the most satisfactory measure of quantity which we possess. The weight of bacteria in the moist state is much more influenced by extraneous, not always easily controlled, conditions, such as humidity, than is the weight of bacteria dry. Comparison of weights moist is not, therefore, to be recommended as a method of standardization. If a preliminary determination of the relation of weights moist and dry be made, then the weight moist may be taken for the subsequent manipulations required for the preparation of standard suspensions of bacteria such as are used in bacteriologic technic (agglutination, opsonic index, etc.), and for preparation of vaccines. If weight of bacteria is the most satisfactory standard of quantity available it is essential that vaccines should have their dosage expressed in terms of weight. Methods of standardization by enumeration are best carried out with suspensions of moist, young, actively growing bacteria (1) because the enumeration by colony count demands that all the bacteria used should be living, (2) because suspensions in the ordinary media used are most easily made in this way. Brown's experiments indicated that there was no loss of antigenic power during desiccation. As a method of enumeration Braxton Hick's procedure with standardized suspensions of organisms was found to be satisfactory.

Brown's method, in which an acid-fast organism was used, dispensed with the need for two standard suspensions and gave better staining results. It is necessary to ensure the adhesions (as e. g., by use of an albumin solution) of the bacteria in such standard suspensions to the slide surface, otherwise the values obtained will vary very considerably. Determination of quantity by an opacity method is easily carried out by contrasting the test suspension with specially prepared standard suspensions in tubes of equal caliber. A special instrument such as a colorimeter makes the determination still easier.

19. **Preparation of Typhoid Vaccines.**—Blaker found that the growth obtained in broth sterilized in a Koch's sterilizer is more vigorous than that in broth sterilized in an autoclave. After forty-eight hours of incubation there is evidence of commencing death of bacilli, as is evident from the plate culture method of enumeration and microscopic examination. Blaker says that the plate culture method of standardization should not be applied to a broth vaccine grown for longer than forty-eight hours as it would show too low a bacillary content. Although by means of Wright's method of enumeration standardization can be effected, even after forty-eight hours' incubation, the increasing autolysis which takes place after this period renders it doubtful whether growth should be allowed to go on longer. If allowed to do so, the accuracy of the standardization is liable to be affected.

20. **Reaction of Typhoid Inoculation.**—Of 143 patients inoculated more than nine months previously only 21 gave agglutination reactions in a dilution above one in 16, and of these 20 agglutinated in no higher dilution than one in 20. In a patient, previously inoculated against typhoid at an interval of not less than six months, a positive typhoid agglutination reaction in higher dilution than one in 40 indicates the probability of the disease from which the patient suffers being typhoid.

Indian Medical Gazette, Calcutta

July, XLIX, No. 7, pp. 253-296

23 Fatal Case of Ophithoxemia. F. Wall.
24 Cocain Eaters of Bombay. A. W. Tuke.
25 Plague Jottings. F. P. Connor.
26 Osseous New Growths at Elbow Joint Following Injuries to Joint —Not Necessarily Dislocations. J. A. Shorten.
27 Three Cases Illustrating Unusual Sequela of Malarial Fever Due to Plasmodium Falciparum. R. Dowden.
28 Treatment of Uncomplicated Retroversion of Uterus by Sling Operation. T. B. Hance.
29 Nature of Jail Dysentery. L. B. Scott.
30 Treatment of Cholera by Exhibition of Chlorhydrate of Emetine in Hypodermic Injections. Renault.
31 Case of Pulmonary Tuberculosis Treated with Tuberculin. G. C. Chatterjee.
32 Two Cases of Transposition of Viscera. B. P. Daruvala.

Journal of Tropical Medicine and Hygiene, London

July 15, XVII, No. 14, pp. 209-224

33 Ankylostomiasis in North Nyasa District. A. G. Eldred.

Lancet, London

July 25, II, No. 4743, pp. 207-280

34 Localization of Motor and Speech Centers in Definite Areas of Cortex and Brain. E. Dupuy.
35 *Reduction in Virulence of Tubercle Bacilli Stored in Normal Saline. L. S. Dudgeon.
36 Observations of One Hundred and Twenty Cases of Lead Absorption from Drinking-Water. W. W. Stainthorpe.
37 Celluloid Splints in Treatment of Acute Cases of Poliomyelitis. F. E. Batten.
38 Epidemic Catarrhal Jaundice. E. A. Cockayne.
39 *Problems in Cardiac Physiology. A. F. S. Kent.
40 Case of Tuberculous Disease of Vertebra. J. Miller and A. F. Hewat.
41 *Surgical Treatment of Streptococcic Arthritis. J. O'Conor.
42 Technic of Abderhalden's Serum Reaction. W. E. Bullock.
43 *Geographic Distribution of Appendicitis. R. W. Murray.

35. **Tubercle Bacilli in Normal Saline.**—Certain experiments are cited by Dudgeon which show the effect of storage on the pathogenicity of the tubercle bacillus. There was a gradual reduction of the pathogenicity of the bacillus stored in normal saline. No attempts were made, however, to subcultivate the stored bacillus direct from the saline bacillary mixture.

39. Published in the *British Medical Journal*, July 18, and abstracted in THE JOURNAL, August 15, p. 609.

41. **Treatment of Streptococcic Arthritis.**—O'Conor makes it a rule to operate on patients who do not promptly yield to medical treatment (sodium salicylate 3ss., sodium bicarbonate 3j., three-hourly; salines, milk diet, woolen clothing, etc.). All infected joints are opened, flaky turbid lymph is evacuated, free irrigation with warm oxygen water, drainage tubes inserted and retained *in situ* for three days. Multiple incisions are made into areas of periarticular cellulitis and not mercurial fomentations applied. Splints are employed for immobilization purposes for from seven to ten days, at the end of which the patient is requested to commence graduated active moment. When wounds are healed gentle massage is prescribed.

43. **Geographic Distribution of Appendicitis.**—Murray claims that diet is a very important factor, probably the important factor, in the etiology of appendicitis. As this disease prevails among meat-eating nations it is further probable that the view of the late Dr. Williams is the correct one, namely, that the most important constituents in our food predisposing to appendicitis are the saturated fats, such as are contained in beef and mutton. Apart from the question of diet, other contributory causes have to be considered. Irregular meals, the "quick lunch," and imperfect teeth all play their part, and the general want of physical exercise is very noticeable.

Quarterly Journal of Medicine, London

July, VII, No. 28, pp. 325-495

44 *Aggressins in Appendicitis and Other Varieties of Peritonitis. A. D. Gardner.
45 *Leukemias: Analysis of Fifty-Nine Consecutive Cases. P. N. Panton, H. L. Tidy and G. H. Pearson.
46 *Fragility of Red Blood-Corpuscles in Physiologic and Pathologic States. A. D. Bigland.

47 Case of Prolonged Cheyne Stokes Breathing (Twenty-One Weeks). W. H. White, J. H. Ryffel, E. P. Poulton, W. Johnson and R. A. Chisolm.
48 Importance of Functional Activity in Etiology of Nervous Diseases. W. Johnson.
49 Blood-Pressure Estimations in Disease by Oscillatory and Auditory Methods. G. S. Melvin and J. R. Murray.
50 Formation of *B*-Iminazolylethylamine in Ileum of Certain Constipated Subjects. Urine in Constipation. N. Mutch.
51 Family Cerebral Degeneration with Macular Change (So-Called Juvenile Form of Family Amaurotic Idiocy). F. E. Batten.
52 Diagnosis of Pancreatic Disease. A. F. S. Sladden.

44. **Aggressins in Appendicitis and Peritonitis.**—A considerable number of peritoneal exudates were tested by Gardner for aggressive action (inhibition of phagocytosis *in vitro*). Inasmuch as aggressiveness is the direct consequence of a profuse multiplication of bacteria, the greater the number of bacteria, the more likely is the fluid to act aggressively. Early exudates therefore (first twenty-four hours) are never aggressive. Gardner found that aggressive substances are nearly always present in pus from appendicular abscesses, and they do no harm so long as the abscess wall remains intact. But they may play an important and dangerous part when a channel of communication is formed between the abscess cavity and the general peritoneum. In spreading or already diffuse peritonitis, the formation of aggressive bodies signifying as it does bacterial activity, marks the onset of a graver stage of infection. A consideration of aggressins, their origin and their action, suggests that a discriminating use of bactericidal chemicals may be of great value in the surgical treatment of peritonitis. Ether and colloidal silver are two such bodies which have undergone a successful trial.

Any exudate found in the peritoneal cavity in gangrenous or perforative appendicular peritonitis may be aggressive, unless it is very recent (twenty-four to thirty-six hours), when it is very unlikely to show any aggression, or it is quite clear and transparent, in which case it is never found to be aggressive. Thick, offensive pus is nearly always aggressive, and usually to a high degree. Appendicular abscesses in the vast majority of cases contain markedly aggressive pus. The presence of a strongly aggressive exudate in the general peritoneal cavity is a great danger to the patient. In the treatment of several varieties of peritonitis, Gardner states, closer attention might with advantage be paid to the question of bacterial multiplication, and to the direct means which are open to the surgeon of checking it. Local chemotherapy by means of drugs which kill or paralyze bacteria without damaging to any considerable degree the living body-cells, Gardner says, is not only possible, but has been proved in practice to be at least worthy of a more extensive trial.

45. **Leukemias.**—Of 59 consecutive cases of leukemia studied by Tidy and Panton, 16 were classed as acute myeloid, 29 as chronic myeloid, 8 as acute lymphoid leukemia, and 6 as chronic lymphoid. It was evident that the clinical picture of leukemia varies with the acuteness or chronicity of the disease, and not with the lymphoid or myeloid origin of the cells. Acute lymphoid and acute myeloid leukemia are clinically indistinguishable, and so may be chronic lymphoid and chronic myeloid leukemia. Acute lymphoid leukemia has little resemblance to chronic lymphoid, nor acute myeloid to chronic myeloid, except in so far as chronic myeloid may terminate by a condition similar to the acute disease. One can distinguish by a blood examination between the acute and chronic types of myeloid leukemia, but not between acute and chronic lymphoid leukemia. The latter diseases are readily distinguished on clinical grounds. Acute myeloid and acute lymphoid leukemia can be distinguished by the type of cell present, but the conditions have been frequently confused and the clinical course is the same. The confusion has been due to a failure to distinguish between myeloblasts and lymphocytes. The differentiation is rarely if ever difficult for those accustomed to the use of Leishman's or other similar stains. In this connection the authors have found oxydase reaction to be quite useless. In no case in the authors' experience has the myeloid type of cell been replaced by the lymphoid type, or vice versa.

The effect of treatment in the acute cases has been negligible. In the chronic lymphoid cases changes have been extremely slight. In the chronic myeloid cases, some have changed little, others have changed to a remarkable degree. Those cases which have fluctuated to the greatest extent have been the youngest subjects. The blood of patients over the middle age reacts but little. There has been no instance of purpura in either of the chronic leukemias. In those cases of acute leukemia associated with purpura the spleen was invariably enlarged. Infiltrations of the skin, painful bones, and priapism occurred in no case. Oral sepsis did not appear to have any bearing on any type of the disease. The cases of acute myeloid leukemia include an interesting group of four patients whose predominant blood-cell was a so-called Rieder cell. This cell Tidy and Panton believe to be a large hyaline, partly on morphologic grounds, since the cell may be indistinguishable from the large hyaline of normal blood, and intermediate types between the normal cell and the primitive marrow-cell were numerous; partly on functional grounds, because these cells were actively phagocytic, as are those of the normal blood. They consider that a scrutiny of these cases affords strong evidence of the marrow origin of the large hyaline cell.

46. **Fragility of Red Blood-Corpuscles.**—A method is described by Bigland of accurately and easily determining the fragility of red blood-corpuscles toward the hemolyzing agent saponin. Human red blood-corpuscles show a constant figure of resistance toward saponin hemolysis. The serum is markedly protective against the action of saponin, but this power varies within certain limits. The corpuscles of various animals show marked variation in their fragility. In jaundice the resistance of the washed red blood-corpuscles is markedly diminished, while the protective action of the serum is markedly increased. This latter result is not due only to the antagonistic action of saponin and bile salts. In all the anemias, except pernicious anemia, the corpuscular resistance is increased. In pernicious anemia it is normal or slightly diminished. In splenic anemia there is great increase in corpuscular resistance, and the serum appears to have no protective reaction. In the anemia found in malignant disease, syphilis, tuberculosis, scurvy, amyloid disease and myelogenous leukemia, and in a case of splenectomy, there was an increased corpuscular resistance. In diabetes the corpuscular fragility is normal, while the serum in some cases is abnormally protective. In exophthalmic goiter and paroxysmal hemoglobinuria the corpuscular fragility is normal. In polycythemia the resistance is increased. A high temperature appears to increase corpuscular fragility.

Sei-I-Kwai Medical Journal, Tokyo

July, XXXIII, No. 27, pp. 39-43

53 Chief Symptoms and Signs of Acute Appendicitis. Y. Takaki.

Archives Mens. d'Obst. et de Gynéc., Paris

June, III, No. 6, pp. 513-602

54 The Thorax in the New-Born. E. Maurel.

Journal de Médecine de Bordeaux

LXXXV, Nos. 26-28, pp. 437-482

55 *Meningeal Symptoms in Scarlet Fever and Scarlatinal Uremia. P. Mauriac and P. Philip.
56 Multiple Skin Abscesses Due to Sporothrix; Two Cases. F. Bonnel, Verdelet, Petges and Lasserre.
57 Sunshine and Sea Air in Treatment of Surgical Tuberculosis. J. Doche.
58 *Hemorrhagic Effusion in Pleurisy. Creyx.

55. **Meningeal Symptoms in Scarlet Fever.**—Mauriac and Philip report the case of a child with unsuspected scarlet fever who suddenly developed epileptiform convulsions from severe uremia affecting the central nervous system. Under treatment the condition improved, the child roused and the temperature returned to normal, but the third day it ran up again and the child died in coma. Pneumococci were cultivated from the cerebrospinal fluid and there was a high urea content as also in the blood. In a second case the mild scarlet fever without albuminuria had been properly treated

but during convalescence the girl of 15 got chilled one evening and fulminating subacute nephritis with pulmonary edema followed and soon proved fatal. The extreme gravity of abortive, unrecognized forms of scarlet fever and the complexity of scarlatinal and uremic meningeal conditions are emphasized by these cases and some others cited. There were none of the signs of actual meningitis, no Kernig, no stiff neck, no vomiting; the convulsions dominated the clinical picture. The meninges evidently suffer in scarlet fever and one must be on the lookout for superposed acute infection. The prognosis otherwise depends on the degree of the retention of urea. A high temperature accompanying the convulsions suggests superposed infection.

58. **Hemorrhagic Pleurisy.**—Creyx says that when the effusion is hemorrhagic, clots may form and impede the escape of fluid when the puncture is made at the lowest point, which otherwise is the preferable technic.

Presse Médicale, Paris

July 18, XXII, No. 57, pp. 545-556

59 Technic for Intravenous Injection of Neosalvarsan with Small Amount of Vehicle. P. Le Damany.
60 Renaisance of Scientific Study of Mineral Waters. (Pouvoir catalytique des eaux minérales; leur richesse plurimétallique.) R. Glénard.

Revue de Chirurgie, Paris

July 10, XXXIV, No. 7, pp. 1-136

61 *Correction of Contracture of Fingers. M. H. Morestin.
62 *Retroduodenal Operation for Calculi in the Pancreas. (Lithiase pancreatique.) Lacouture and Charbonnel.
63 *Snapping Joints. (Les articulations à ressort; Subluxations volontaires intermittentes des articulations.) P. Bertein. Commenced in No. 5.

61. **Treatment of Deformed Fingers.**—Morestin refers to fingers permanently contracted as the result of some pathologic process in them or in the vicinity. Treatment is as simple as it is effectual when all the obstacles preventing the use of the finger are cut away in turn, the scar tissue, the debris of tendon sheaths, the muscles and the shriveled ligaments, passing systematically with minute care from one to the other until all that interferes with the straightening of the finger is done away with. The triangular or square flaps cut to alternate and turn back for access to the deeper soft parts, can be brought back to cover the defect, utilizing also the cicatricial tissue that has been binding down the finger, and the result is quite satisfactory, much more than would be anticipated. He has found it possible in this way to restore practically complete function to a thumb, for instance, left absolutely crippled after an abscess or other lesion. He makes no attempt to restore the tendons. The fingers can serve very useful purposes without the tendons; the muscles of the thumb suffice to bend it, and a finger once rendered flexible bends with the others. All his patients had the wage-earning power of the hand restored. He gives an illustrated description of five peculiarly striking cases.

62. **Calculus in the Pancreas.**—Lacouture and Charbonnel report a case in which a calculus was successfully removed from the pancreas, which was opened back of the duodenum. They have found only 133 cases of pancreatic lithiasis on record, including 16 in which operative treatment was applied. In their case roentgenoscopy later showed that the woman of 32 still has five very small calculi left in the pancreas. Although she feels well except for slight pain under the right costal arch, yet she is kept on a diet free from meat and fat in order to spare the pancreas as much as possible. In 5 of the 16 operative cases the stone could not be found and 3 of the patients died, as also 2 others requiring extremely complicated operations. The mortality was thus 34 per cent.; and 1 patient died several years later from pancreatic diabetes. The final outcome otherwise is not known except in 3 cases in which the patients were in good health after from four to fourteen months.

63. **Snapping Joints.**—No cutting is required as a rule to correct this tendency to volitional, intermittent subluxation in a joint. A plaster cast will hold the parts in place and give the stretched capsule a chance to retract and put an end to the abnormal play of the parts. Afterward the joint should be kept from overuse.

Revue Mens. de Gyn., d'Obstét. et de Pédiatrie, Paris

June, IX, No. 6, pp. 367-427

64 Tardy Fistula after Cesarean Section; Two Cases. A. Grosse.
65 Cystic Degeneration of Ovary with Hydatidiform Mole; Author's Fifth Case. G. Calderini.
66 Third Cesarean Section at Term in Three Years; Twins. R. Gilles.

Semaine Médicale, Paris

July 15, XXXIV, No. 28, pp. 325-336

67 Comparative Test Elimination of Iodin and Lactose in Various Types of Nephritis. F. Widal and P. V. Radot.

Archiv für klinische Chirurgie, Berlin

CV, No. 1, pp. 1-276. Last indexed July 25, p. 357

68 *Transplanted Connective Tissue. (Das cutane und subcutane Bindegewebe in veränderter Funktion.) E. Rehn and Miyauchi.
69 *Disturbances and Dangers from Cystic Goiter. (Kropfcysten.) Riedel.
70 *Tying Off the Pylorus. (Ergebnisse der Pylorusausschaltung durch Fadenumschnürung.) N. Guleke.
71 *Resection of Gastric Ulcer. (Resektion des Magens bei Magengeschwür.) G. Perthes.
72 *Cause and Treatment of Postoperative Abdominal Hernia. (Bauchbrüche.) Sprengel.
73 Stab Wounds of the Brain through Base of Skull. (Stichwunden des Gehirns von der Schädelbasis aus.) S. Solieri.
74 *"Total Peripheral Anesthesia" after Intravenous Injection of Local Anesthetics. A. W. Meyer.
75 Primary Resection of Large Intestine. (Dickdarmresektion.) R. von Rauchenbichler.
76 Connection between Disease in the Appendix, the Cecum and the Sigmoid Flexure. (Beziehungen der Erkrankungen des Wurmfortsatzes zu denen des Coecums und S Romanum.) E. Opitz.
77 Operative Reduction of Old Dislocation of the Elbow, with or without Fracture. P. R. von Walzel.
78 *Postoperative Necrosis of the Pancreas. Jenckel.

68. **Transplanted Connective Tissue.**—Rehn and Miyauchi give an account of their experimental research with skin and subcutaneous connective tissue used to substitute tendons, ligaments, etc., and fourteen clinical cases in which the method was successfully applied. Whether used as a twisted cord or flat sheet, it healed always in place without signs of irritation and answered its purpose perfectly either as a tendon, a ring to reenforce a sphincter, or a broad strengthening band. It seemed to answer the purpose fully as well as fascia or tendon flaps.

69. **Cystic Goiters.**—Riedel states that among the 1,075 patients who were operated on for goiter in his service, large cysts were found in the thyroid in 148. He here discusses the disturbances and dangers to which a tendency to such cysts exposes the patient.

70. **Tying off the Pylorus.**—Guleke has recently reexamined nearly all of the thirteen patients who required exclusion of the pylorus; this had been done by ligating it with silk. Two died in a few weeks from preexisting complications. The others were found all in good condition, the pylorus still completely shut off. He does not regard this method of ligating the pylorus as superior to others but his experience indicates that it is feasible and gives good results when special circumstances render it necessary to hasten the operation and bring the patient out from under the anesthetic. The eleven cases are reported in detail.

71. **Resection of the Stomach for Ulcer.**—Perthes reports that among 40 operations of the kind, the 18 patients treated by transverse resection all made a smooth recovery, while 2 died of the 17 with resection of the pylorus for a hard ulcer and one after resection of the middle half of the stomach. He has learned that 2 of the 11 patients with hard ulcer have died since from cancer, and this is probable also in a third fatal case. Even the resection did not save these patients.

All the other patients are in excellent condition and have gained materially in weight. Some complain of an insatiable appetite; they are ready to eat at all hours of the day, but not much at a time. Roentgenoscopy has explained this as due to the abnormally rapid emptying of the stomach after

food is taken; the stomach being more of a straight tube, the food passes rapidly along and the lack of gastric digestion has to be made up by more frequent meals. The pylorus gapes all the time in these cases. These findings were obtained only in certain cases; in others the appetite seemed to be normal and roentgenoscopy showed that the food remained the usual time in the stomach. The secretion of gastric juice, however, was materially reduced in both classes of patients. The excellent general condition shows that the bowels are able to compensate for the deficiency in gastric digestion.

72. **Postoperative Ventral Hernia.**—Sprengel's article was the address to open the discussion on this subject at the last German Surgical Congress. It is illustrated and closes with the warning that the danger of postoperative hernia depends on the mode of the incision and its location; the upper abdomen is less liable to it than the lower. The principle of alternating and transverse incisions is unmistakably superior to the single incision. There is still uncertainty as to the best technic further, but there seem to be no reasons for prophylactic plastic operations to ward off ventral hernia. He does not approve of using an autoflap of muscle tissue to correct a postoperative abdominal hernia, preferring an unpedunculated fascia flap for the purpose. Paralysis of the abdominal walls and extensive stretching of the side walls of the abdomen must be regarded at present as beyond hope of a cure.

74. **Total Peripheral Anesthesia from Intravenous Injection of Local Anesthetic.**—Meyer made an intravenous injection of cocain in dogs and cats and gives the details of twelve such experiments. The injection was preceded by a little morphin and scopolamin, and the results confirmed those published by Meltzer, Kast and Ritter in regard to the total peripheral analgesia thus induced. Even the peritoneum seemed to be totally free from sensibility. Contact was evidently felt but no pain. The analgesia seemed to be restricted to the periphery; the peripheral nerve terminals to which the anesthetic is brought by the blood feel the effects while the nerve trunks escape.

78. **Postoperative Necrosis of the Pancreas.**—Jenckel states that he has had 11 cases of acute or subacute necrosis of the pancreas in his service in the last three years, and in two instances the necrosis had followed on an operation. In one of these latter cases the operation had been the removal of a cancer in the sigmoid flexure in a man of 56; in the other case a large ovarian cyst had been removed from a woman of 64. There had been nothing previously to suggest any pancreas trouble, and the acute necrosis developed soon after the operation and proved fatal the sixth and sixteenth days. He is inclined to ascribe the necrotic process to the resection of the omentum which had been required in each of the cases. Retrograde embolism followed, and this injured the pancreas tissue and started the autolysis.

Centralblatt für die Grenzgebiete der Med. und Chir., Jena

July, XVIII, No. 4, pp. 319-390

79 *Thorax Surgery and Differential Atmospheric Procedures. (Thoraxchirurgie und Druckdifferenzverfahren.) F. Steinmann.
80 *Iodin and Exophthalmic Goiter. (Basedow und Jodbasedow und deren Zusammenhang mit dem System der Drüsen mit innerer Sekretion.) A. Kempner.
81 *Reflex Epilepsy and Its Operative Treatment. S. Kalischer.

79. **Thorax Surgery and Differential Pressure.**—Steinmann lists 221 articles bearing on this subject and compares the experiences and views of the various writers with his own clinical work. He expatiates on the great value and importance of the differential-pressure procedures not only as an almost indispensable aid in operations on the thorax, but as also of service in revealing a wound in the lung by the air streaming through it, in locating foreign bodies, and in facilitating ligation or gentle clamping to expel the blood from a lobe. Another great advantage is that the suction of air aspirates out blood, mucus and pus in opening an abscess or other cavity in the lung. This is found extremely useful often in changing the dressings. Küttner made an opening into a bronchus in a case of deep stenosis of the trachea, thus permitting retrograde respiration. Differential pressure is also of great service in operating on the heart; in fully 80 per cent. of all wounds of the heart the pleura is injured likewise. Exploratory thoracotomy under differential pressure is now a routine measure, and by alternating positive and negative differential pressure, artificial respiration can easily be kept up indefinitely.

80. **Iodin and Exophthalmic Goiter.**—Kempner concludes from the literature on this subject that there can be no doubt that iodin, even in minute doses, is liable to elicit Basedow symptoms in persons with a goiter. The evidence further shows that true Basedow may develop from an acute thyroiditis. Three authors have published cases in which patients with clinically normal thyroids developed Basedow symptoms while taking iodid for arteriosclerosis, tabes or a false tumor in the brain. Romheld and Pineles have noticed a connection between an iodin-Basedow and an inherited taint such as diabetes, obesity, Basedow or neuropathy. This confirms anew the close connection between the iodin-Basedow and other glands with an internal secretion as well as the thyroid; possibly the Abderhalden reaction might throw light in these cases. Ohlemann does not agree with other writers on this subject; he states that exophthalmic goiter was favorably influenced in his own person by 10 or 20 drops daily of a ⅓ solution of potassium iodid, kept up for six weeks; his pulse-rate dropped by 68 beats. Later, he took 2 to 4 drops of tincture of iodin (P. G.), his pulse going down to 72 in ten days and the improvement persisting for ten months after this treatment. He thinks that too large doses are responsible for the unfavorable effects experienced by others.

Kempner warns that a family predisposition to goiter, Basedow and aneurysm of the aorta is sometimes evident, and calls for special caution in giving iodin. Kienböck found the thyroid slightly enlarged in nearly every case of dilatation or aneurysm of the aorta in men, and noted signs of hyperfunctioning on the part of the thyroid in most of the cases. He explains the tendency to goiter in these cases as the result of venous congestion from the pressure of the enlarged aorta. It is possible however that the thyroid may have become enlarged under the influence of preceding iodin treatment, or that both the thyroid symptoms and the aorta affection can be referred to a common cause, some upset in the ductless-gland system.

81. **Reflex Epilepsy.**—Kalischer applies this term to cases in which the epileptic seizure is a reflex reaction to peripheral irritation. His analysis of eighty-four articles published on the subject shows that in a large number of cases hysteria alone can be incriminated; in others the trauma was merely a contributing factor with a predisposition. At the same time there are cases on record in which lesions of the skin, mucosa, bones and meninges were evidently responsible for the epilepsy, and the latter was cured by appropriate treatment of the peripheral lesion. An interval of five years at least must be required before speaking of an absolute cure.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 4, XLIV, No. 27, pp. 833-864

82 *Pernicious Anemia in Children. M. Kusunoki.
83 Mechanical Treatment of Tuberculous Lung. (Zur intra- u. extrapleuralen Collapstherapie bei Lungenphtise.) W. Knoll.

82. **Pernicious Anemia in Children.**—Kusunoki reports from Basel the case of a girl of 6 with anemia of unknown cause. The color-index was high, the reds dropped from 1,868,000 to 510,000 and the hemoglobin from 40 to 10 per cent. in the course of five weeks. The presence of megaloblasts and megalocytes, absence of leukocytosis, the tendency to hemorrhages and all the histologic findings testified to true pernicious anemia. Several lymph-nodes were swollen but this is of such common occurrence in children that it can be disregarded in the diagnosis. Streptococci were cultivated from the tonsils. He reviews the few cases on record of pernicious anemia in young children, remarking that some of them evidently belong in other categories.

Deutsches Archiv für klinische Medizin, Leipzig

CXV, Nos. 5-6, pp. 399-638. Last indexed Aug. 1, p. 435

84 Composition of the Air in Pneumothorax. F. Tobiesen.
85 Ferments of the Sputum. (Chemie des Sputums. II.) E. Maliwa.
86 Adhesive Pericarditis and Disappearance of the Normal Lateral Vertical Change of Position in the Heart on Changing from a Lying to a Standing Position. W. Achelis.
87 Oxidation of Sugar in Pancreatic Diabetes. M. Landsberg.
88 Carcinomatous Meningitis. (Ueber latenten Meningealkrebs.) H. Eichhorst.
89 Heart Disturbances after Pneumonia. J. Zadek.
90 Analysis of the Mechanical Work of the Heart. (Dynamik des Säugetierherzens.) H. Straub.
91 *The Leukocyte Count in Miliary Tuberculosis and Its Value in Diagnosis. P. Wack.
92 Paradoxical Pulse. M. Semerau.
93 Effect of Human Serum in Scarlet Fever not due to Lipoids. (Scharlachbehandlung mit Humanserum und Serumlipoide.) W. Schultz.

91. **The Leukocyte Count in Miliary Tuberculosis.**—Wack declares that in miliary tuberculosis there is a relative decrease in the lymphocytes. This is found in cases in which there is no secondary affection, showing it to be due to the tubercle bacilli alone. There is a temporary decrease in the total leukocyte count in many cases. This is of value in the differential diagnosis from typhoid, purulent meningitis and pulmonary tuberculosis. A case is described that showed the clinical and hematologic picture of acute myeloid leukemia. Autopsy revealed subacute miliary tuberculosis. Roth believes that the miliary tuberculosis was the cause of the myeloid leukemia. Several similar cases have been described in the literature. The severity of the infection causes an early interference with the function of the bone-marrow, so that immature forms of cells are discharged into the blood.

Medizinische Klinik, Berlin

July 26, X, No. 30, pp. 1255-1298

94 Hygiene of Voice and Speech. (Stimme und Sprache.) E. Fröschels.
95 Serodiagnosis in Nervous and Mental Diseases. H. Neue. Commenced in No. 29.
96 *Treatment of Fresh Gonorrhea. (Eine Behandlungsmethode des frischen Trippers der Männer.) L. Merk.
97 Congenital Myxedema and Thyroid Treatment. (Thyreoaplasie und ihre Therapie.) W. Schemensky.
98 Etiology and Vaccine Therapy of Ozena. J. Safranek.
99 Heat as Factor in Balneology. (Anteil der Badewärme an den therapeutischen Erfolgen der Solbäder.) Jeddeloh.
100 Benefits of Early Treatment Seen in Workings of Workman's Compensation Laws. (Zur Frühübernahme des Heilverfahrens.) P. Zander.
101 Insufficiency of Bladder Sphincter in Women. (Blasenschwäche des Weibes.) B. Hirschfeld.
102 Protective Ferments in Urine. (Nachweis von sogenannten Abwehrfermenten im Urin.) V. Kafka.
103 Action of Carbonated Baths on the Circulation. (Zur Frage der Kreislaufwirkung kohlensäurehaltiger Solbäder.) O. Müller.

96. **Treatment of Recently Acquired Gonorrhea.**—Merk gives the patient a set of vials each containing a mixture of 0.03 gm. silver nitrate and 0.025 gm. potassium permanganate in pulverized form. When ready to use this is stirred into 0.25 liter of freshly boiled tap water. No syringe is used, merely a catheter No. 9, French, with two openings at the tip and flaring outer end. The fluid still as hot as it can be borne by the urethral mucosa is drawn up into a rubber bulb and then forced out into the funnel opening of the catheter. It thus rinses out the urethra from the rear, and large amounts of fluid can be used. If the tap water contains salts that precipitate the silver nitrate, he varies the amount in the vials to correspond. The procedure is repeated three or four times a day and the whole technic is so extremely simple and easy that the patients apply it systematically and seldom shirk. Merk describes the biologic and chemical factors involved in the action of silver nitrate and shows how none of the would-be substitutes shares its truly potent properties, and how the claims made for some of the proprietary substitutes exalt into alleged advantages what are really drawbacks.

Wiener klinische Wochenschrift, Vienna

July 23, XXVII, No. 30, pp. 1093-1132

104 *Prophylaxis of Cholera in Greece by Preventive Inoculation. (Choleraschutzimpfung.) C. Savas.
105 *Changes in Spinal Fluid after Injection of Neosalvarsan. P. Biach, W. Kerl and H. Kahler.
106 Diastolic Blood-Pressure in Diagnosis of Disease of Aorta. J. S. Schwarzmann.
107 Electric Stimulation of Phrenic Nerve and Roentgenoscopic Findings Therewith. A. Henszelmann.
108 *Deleterious Influence of Nephritis on Procreation. (Einfluss der Nephritis auf die Zeugung.) J. Cecikas

104. **Anticholera Inoculations.**—Savas states that there was no cholera in Greece or its dependencies until Grecian troops invaded Bulgaria last July and entered cholera-infested cities after fighting their way over 250 to 300 kilometers in twenty-six days. Refugees to the number of 150,000 also poured into Greece from various directions, and thus cholera broke out almost at once in many towns. Even Saloniki had 600 cases. As soon as the truce was proclaimed, systematic inoculation of the troops and populace was commenced and the epidemic was arrested. Fully 2,503 soldiers were treated for cholera in the hospitals, with a mortality of 515 (20.6 per cent.), including 27 officers and 9 surgeons, with recovery of 22. The number of cases in old and new Greece was 5,200 and 5,300, with 1,665 and 1,700 deaths. Savas prepared 1,000 liters of cholera vaccine and had twenty flying cholera laboratories at work, and in three months had vaccinated all the troops, a total of 150,000 men, and 350,000 of the populace, a total of 500,000 souls. When possible each person was inoculated twice with an eight-day interval. The vaccination was done by the regiment's surgeons, and never to but a small part of the regiment at one time. It never seemed to interfere with their military duties.

Savas gives tables which show graphically the success of the measure. For instance, in the whole army 19 per thousand developed cholera: 93 per thousand among the unvaccinated; 42 per thousand among those inoculated only once, and 7 per thousand among those who had been twice inoculated. The mortality among the unvaccinated was 27.5 per cent. while it was 12.2 among those inoculated once and 10.2 per cent. among the twice inoculated. Cholera soon disappeared from the infested towns after the dual vaccinations.

105. **Changes in Spinal Fluid after Injection of Neosalvarsan.**—Biach and his coworkers state that in nine of twelve cases sugar appeared in the spinal fluid after injection of salvarsan or neosalvarsan. The findings are tabulated and compared with an equal number not given salvarsan treatment. The stage of the syphilis or the reaction otherwise to the injections did not seem to influence the sugar content. It seems evident that individual conditions are responsible for the appearance of the sugar. Persons with it are, possibly, more liable to react to salvarsan with nervous symptoms.

108. **Nephritis and Child-Bearing.**—Cecikas thinks it is more than a casual coincidence that only eight of his twenty-eight married patients with nephritis have borne healthy children; abortion was common and five of the women never conceived.

Zeitschrift für Kinderheilkunde, Berlin

June, XI, No. 3, pp. 191-266. Last indexed July 25, p. 363

109 Peculiar Form of Diphtheria of the Gums in Two Infants. Z. v. Bokay.
110 The Urine During the First Few Days of Life. T. Franz and A. v. Reuss
111 Metabolism with Congenital Fragility of the Bones. (Osteogenesis imperfecta.) A. Schabad.

Riforma Medica, Naples

July 18, XXX, No. 29, pp. 785-812

112 *Woody Phlegmon and Inflammation of the Thyroid. (Flemmone ligneo del Reclus e tiroidite lignea del Riedel.) U. Cavalli.
113 *Operative Cure of Gastric Cancer. G. De Francisco.

112. **Woody Phlegmon.**—Cavalli reviews the present status of our knowledge in regard to woody phlegmon and woody thyroiditis. Everything tends to show that they are identical processes and that nothing more is required for either than simple incision and draining at most. In a case reported, the large woody phlegmon developed in the abdomen after an operation for hernia which had been followed by an abscess and expulsion of the silk sutures. The patient was kept in bed, ichthyol packs applied with moist heat, and potassium iodid was taken internally. The hard swollen

expanse was not tender and an incision brought merely a little serous fluid, but streptococci were cultivated from a scrap of tissue. By the end of the month all had returned to apparently normal condition.

113. **Operative Cure of Gastric Cancer.**—De Francisco found only 4.44 per cent. operable in his 45 cases of gastric cancer in the last eight years, and one patient is now in the best health sixteen months after resection of part of the stomach and the pylorus by the Billroth I technic. He sutured with silk and the next day began to feed by the mouth. The third day the bowels moved after an injection of glycerin and the patient left the hospital the twelfth day. He was a man of 38 and the first symptoms were noted five months previously, pain in the stomach an hour after meals, most severe with solid food.

Norsk Magazin for Lægevidenskaben, Christiania

July, LXXV, No. 7, pp. 745-872

114 *Tuberculosis or Inherited Syphilis Responsible for Skin Lesions? W. Holland.
115 Mixed Viruses in Tuberculosis in Children. A. De Besche.
116 Nutrition in the New-Born. (Ernæringsforholdene hos nyfødte.) G. Benestad.
117 *Color Test for Uric Acid in the Urine. (Kolorimetrisk urinsyrebestemmelse i urinen.) H. F. Høst.
118 Melanosis of Left Sclera. H. Gjessing.
119 *Deformity of Urinary Apparatus. (Medfødte misdannelser av nyrer og urinveier.) K. Motzfeldt.

114. **Skin Lesions from Tuberculosis or Tardy Inherited Syphilis.**—Holland reports three cases in which an extensive ulcerative skin affection on the thighs, knees or lower leg was supposed to be of tuberculous origin and was treated as such for years, including Roentgen treatment in one case, but all to no avail. The Wassermann test once applied proved negative in one, positive in another, and under specific treatment the whole trouble in all promptly subsided in from two to five weeks, confirming the final assumption of a tardy manifestation of inherited syphilis. Other details that might have suggested this were the comparatively good general health; the absence of any demonstrable primary tuberculous focus; the extent of the area involved in a comparatively short period, and the fact that in one of the families eight children had died soon after birth.

117. **Color Test for Uric Acid in the Urine.**—Høst tabulates his findings with simultaneous application of the various color tests in vogue. They show that the Riegler method is especially simple and reliable when the technic is slightly modified, as he describes, to render the reagent more durable. It is a 1 per thousand solution of uric acid made by dissolving 0.1 gm. uric acid in a little distilled water in a 100 c.c. graduated flask; adding 10 c.c. of a 0.4 per cent. solution of lithium carbonate and heating for ten or fifteen minutes until the uric acid is dissolved. Then the vessel is filled up to the mark. This solution keeps for a week. He precipitates the uric acid as ammonium urate. Otherwise the technic is the same as Riegler's.

119. **Deformity of Urinary Apparatus.**—Motzfeldt found 79 cases of deformity of some kind at 4,500 necropsies, including 9 of horse-shoe kidney; double ureters in 23; hydronephrosis in 21; aplasia in 10, and hypoplasia in 11—a total of deformities of some kind found in the urinary apparatus in 2 per cent. of all the cadavers. One of the kidneys was abnormally small in 22 cases; the other was hypertrophied in only a few instances.

Ugeskrift for Læger, Copenhagen

July 16, LXXVI, No. 29, pp. 1275-1318

120 *Roentgen Treatment of Uterine Benign Growths and Hemorrhage. J. Nordentoft, H. J. Panner and S. Kjærgaard. Commenced in No. 28.
121 *Radium Treatment for Cancer. (Om Prof. Rovsing og Radiumterapien for Kræft.) E. A. Tscherning.

120. **Roentgenotherapy of Uterine Hemorrhage and Benign Growths.**—Nordentoft devotes six pages to tabulation of the details of the fourteen cases of fibromyoma or metrorrhagia in which he has given a systematic course of Roentgen treatment. All were much benefited, with one exception; this patient was a woman of 40 with a very large myoma. The tumor subsided by about a third but the bleeding kept up and the uterus was amputated. Not a trace of follicles could be found in the ovary; this explained, he thinks, the failure of the radiotherapy. The patients came to his office for the exposures about once in three weeks. He does not think the danger of overlooking a cancer very imminent, especially as sarcoma is particularly sensitive to the rays and would probably retrogress under the mere treatment intended for the myoma. He remarks that he has been unable to find on record any instance of malignant degeneration in the relics of a myoma or fibroma that has retrogressed under Roentgen treatment. On the other hand, he warns to be very wary with the curet; he has encountered two cases in which there was suppuration or necrosis in myomas after curetting of the uterus. The most gratifying results are attained in climacteric hemorrhage without growths of any kind in the uterus. The tendency to hemorrhage is usually promptly and permanently arrested by the Roentgen rays. He makes it a rule to carefully refrain from this treatment when the woman is in the child-bearing age.

Panner and Kjærgaard advise a preliminary curetting for an elderly patient and waiting to see whether this alone will not cure. Acute torsion of the myoma or acute disease in tubes or ovaries or cystic or calcified myomas contra-indicate Roentgen-ray treatment, but chronic disease in tubes or ovaries does not. The nearer to the menopause age, the more effectual are the Roentgen rays.

Sarcomatous degeneration of fibromas is said to occur in from 2 to 10 per cent. but they think this is above the reality; it is not always easy to differentiate a sarcoma from certain fibromas. Even if a sarcoma should thus be overlooked, it is possible that it might retrogress under the roentgenotherapy. The possibility of malignant disease must be taken seriously into account not only for the dire consequence of overlooking cancer but also because it is of such comparatively frequent occurrence; Freund found cancer in the uterus or ovary in 6 per cent. of 500 myoma cases; Klein in 7.7 per cent. of 491 cases, and Mackenrodt in 7.7 per cent. of 418 cases. They cite quite a long list of cases in which a dermoid cyst, or uterine or ovarian cancer was given a course of Roentgen treatment on a mistaken diagnosis. Sellheim's case is also quoted in which a preliminary curetting showed the uterus free from cancer and the malignant disease developed during the course of the Roentgen treatment; it was in the body of the uterus in this case, and in the cervix in Pranqué's and Runge's cases. In conclusion they protest against the assumption that the rays have superseded operative treatment of uterine myomas. They do not supersede but supplement each other. The most suitable patients for roentgenotherapy are elderly women with uncomplicated fibromas and menorrhagia. Also patients whose fibromas are accompanied by constitutional or kidney disease, phlebitis or obesity. The patients must be supervised with special care during the course of treatment so that any mistake in diagnosis can be corrected at once.

121. **Radium Promotes Instead of Checking Cancer.**—Tscherning replies to Rovsing's article with the above title recently summarized in these columns August 8, p. 520. Tscherning protests against his conclusions, declaring that all of the ten cases reported were hopeless from the start, as evident from the published details, or else the dosage was inadequate or the technic defective. Tscherning takes up each of the cases in turn and analyzes them, pointing out discrepancies and expatiating on the absolutely opposite results obtained by other workers with radium. In the 201 cases treated at the Copenhagen radium station during the last years there was nothing to suggest in the remotest Rovsing's experiences. Tscherning admits that the first enthusiasm over radium was excessive, and he calls attention to the warning published by Wickham and Degrais in 1912 that small cancers in the mucosa in the mouth had better be excluded from radium treatment; one of Rovsing's cases was of this kind.